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ORIGINAL ARTICLES.

CARCINOMA LIMITED TO THE APPENDIX VERMIFORMIS; DISCUSSION OF ITS ORIGIN AND ITS RELATION TO APPENDICITIS.

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AND

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THE following cases are reported as of interest, not only from a pathological standpoint but because of features that give them a direct bearing upon a disease that has become of late years almost as frequent in its occurrence as any one other pathological condition.

As appendicitis becomes more and more frequent, the interest in its etiology increases, not only with a view to an effective treatment, but equally with regard to prophylaxis; and as each new cause is discovered some new field, pathological or therapeutical, opens, and the subject must be gone over anew.

By no means the least interesting of the causes of appendicitis is a primary malignant condition of the mucous membrane and its extension to the different coats of the appendix. The total number of cases in which the appendix has appeared to be primarily involved by a carcinomatous growth is still extremely small—in the neighborhood of thirty—and those in which the growth appears to have been limited to the organ comprise a still smaller number, perhaps in all not amounting to more than eight or ten unimpeachable cases, if so many. Moreover, the pathological interest is an unusual one, not only with regard to its possible bearing upon the etiology of appendicitis, but equally with reference to the causation of the carcinomatous growth. The question arises at once whether the carcinoma or the appendicitis has been the primary condition; and if the former whether, after all, the malignant condition consists of anything more than a perversion and overgrowth of the epithelial tissues, stimulated finally to such an extent as to drain the system of fluids and nutritive substances that are needed in the general economy, and perhaps to form a toxin or toxins that go still further toward undermining the resisting power of the tissues. The tendency at present favors the theory of a parasitic or bacterial origin of most, if not all, malignant growths. The question arises, then, in the cases that are before us: Is it necessary that carcinoma be parasitic in its origin, in order to explain either the primary focus or the metastasis? The cases under immediate discussion were ones in which, as far as could be ascertained *intra vitam*, no malignant involvement had occurred outside of the appendix.

The clinical history will be given before we proceed with the discussion of the subject.

The first case was seen by Dr. Willson in private work, and then in consultation with Dr. Harte, who operated at a later date. The clinical notes were as follows:

Case I.—September 3, 1900. Miss——, unmarried, aged twenty-four years. Family history absolutely negative. Mother died of pneumonia; father alive and well; brothers and sisters all healthy. No history of malignant growth on either side of family. Patient has had most of the diseases of childhood, among them measles, whooping-cough, diphtheria, and pneumonia(?). Menses began at the fifteenth year; have always been regular as to time, but with considerable dull pain over the small of the back and in the pelvis. This usually extends over a week's time, of which two days are usually spent in bed. Has never had leucorrhea. Was well and strong until her sixteenth year, when she went through what was probably a chlorotic stage of several months' duration. From that time she was well until her nineteenth year, when, after a bicycle ride, she noticed a pain in the right iliac region, at first sharp, then becoming dull and heavy and continuous. One week later she mentioned the presence of this pain for the first time, and was placed in bed. Diagnosis of appendicitis by attending physician, and confirmed by a surgeon in consultation. Operation discussed, but set aside. Patient was in bed for over four weeks on this occasion, and then rose free from pain. During this attack there was neither diarrhea nor constipation, the bowels remaining practically normal. At no time was there blood in the stools. From this time for over three years the patient appeared well and was free from all symptoms. The bowel movements were regular and normal.

One year ago, and during a period extending over the whole winter, the patient had attacks of pain similar to those of three years previous, but of less severity. Again, and on this occasion without treatment, the symptoms disappeared, and until last summer (four years and eight months from the date of the first attack) she appeared strong and unusually well.

At this time, and after a hard sight-seeing tour on the Continent, a severe, debilitating diarrhea set in, and blood and mucus were noted in the passages. From then until the present date she has experienced pain in the appendicular region, extending less acutely over the entire abdomen, but centering over the appendix. Pain extends also upward and posteriorly over the right lumbar region. This lumbar pain she had noticed markedly in both of her previous attacks, as she now recalls.

One month ago her symptoms all began to in-

crease gradually in intensity, and the patient has at length been forced to yield through alarm at her condition. She describes her pain as one of a spontaneous nature, varying in character, sometimes sharp, sometimes dull, but continuous in duration, and centering constantly over the region of the cecum. Again there is present the dull ache over the right lumbar region posteriorly, whether the patient is in motion or at rest. The appetite is irregular, and there is a slight diarrhea. Temperature normal, pulse 78.

The blood examination showed: Hemoglobin, 100 per cent.; red corpuscles, 5,120,000; white corpuscles, 6,000. No malarial plasmodia present; no poikilocytosis; no nucleated red corpuscles.

Urinalysis: Acid, 1020; pale amber color, transparent; sediment, scanty, white, flocculent; no albumin, no sugar, no peptone (Bruecke's), no albumose; microscopically, no casts, no renal epithelium, few leucocytes and squamous epithelial cells, no crystals.

On physical examination the patient is found well nourished, rather pale, slightly flushed over the cheek bones, conjunctivæ and mucous membranes of the mouth and nose normal; no jaundice; skin clear and healthy; cardiac dimensions and sounds normal; lungs absolutely negative; pulse regular (78), full, soft, and compressible.

Abdomen: Distinct tenderness on palpation, especially over the umbilicus and over the cecum. On deep pressure in the latter region the pain is markedly increased and of a sharp, acute nature. A thickened colon and cecum seem to be palpable under the fingers. Marked resistance of the muscles of the abdomen on the right side in contrast with the left. The spleen and liver are very tender, but neither enlarged to percussion or palpation. Over the right lumbar region is an area of great tenderness, very sensitive to pressure. Patient has a constant dull ache here, and there is a seemingly distinct pain from that noted in the umbilical and iliac regions. No distinct mass can be felt in the iliac region, but a simulation of a thickened appendix can be constantly palpated, and forms the point most sensitive to pressure.

Further physical examination negative.

The patient was placed in bed, on liquid diet and a pill of calomel, gr. $^1/_{10}$, morphine, gr. $^1/_{10}$, sod. bicarb, gr. j, was given every four hours. Applications of heat and cold both proved so disagreeable to the patient that it was decided to dispense with their use.

September 8th.—During the first few days a marked improvement occurred. Abdomen is less sensitive. Still has severe ache over right lumbar region. Much less sensitive over the cecum. Diarrhea has disappeared. A trace of blood has only once been seen in the bowel movement.

Blood examination showed: Hemoglobin, 100 per cent; red corpuscles, 5,200,000; white corpuscles, 6,500; no poikilocytosis; no nucleated red corpuscles.

September 16th.—Abdominal symptoms seem to be slowly clearing up. Pain and ache have disappeared from the right lumbar region, and almost entirely from the abdomen. Deep pressure still elicits tenderness over the cecum. All of the region along the false ribs on both sides is exquisitely tender to pressure, as if due to a rheumatic process. Bowels moving regularly. No blood in the stools. Sod. salicylate, gr. v, every third hour.

September 24th.—No pain at any point in abdomen except over appendicular region, and there only on deep pressure. Pain along costal border his disappeared. Diet slightly increased. Bowel movements slow and constipated. Small scybalæ passed; no blood. Calomel, gr. $^1/_{24}$; eserin sulphate, gr. $^1/_{120}$.

September 26th.—Patient sat up in bed for first time. Some soreness over appendix, but no active pain at any point. Bowel movements normal; good appetite. All medicines discontinued.

September 28th.—Sat up in chair for short time. No return of pain, but seemingly an increasing soreness on palpation and tenderness over the cecum. This is relieved in the erect posture, and becomes more marked when lying down.

September 30th.—Walked slowly down stairs and without discomfort other than a slight dizziness. No active pain, but a constantly increasing tenderness over the cecum. Bowel movements regular and of normal appearance.

October 1.—Walked a few moments in the fresh air and returned tired, but refreshed. Massage of the abdomen twice daily with ung. ichthyol, et iodi comp. Marked tenderness over the appendicular region. No spontaneous pain at any point.

October 2d.—Palpation of appendix seems to show a markedly sensitive mass that rolls beneath the fingers (compare operative findings). No other point very sensitive, though general tenderness seems to be gradually returning. Old and dull pain over the left lumbar region has again appeared. Temperature and pulse normal.

Blood examination showed: Hemoglobin, 98 per cent.; red corpuscles, 4,900,000; white corpuscles, 8,000; no poikilocytosis; no nucleated red corpuscles.

October 8th.—Throughout the past week the abdominal condition has varied slightly. Pain has gradually increased over the abdomen and right loin. The most sensitive point remains fixed over the cecum. Pain is now constant and sharp, with and without pressure. Blister applied over cecal region.

Urinalysis: Acid, 1017, amber color, transparent; sediment scanty, white, flocculent; no albumin, no sugar, urea, 2.10 per cent., marked phosphatic precipitate, with heat; no casts, no crystals, few leucocytes, few squamous epithelial cells.

October 10th.—Patient seen in consultation with Dr. Harte. Examination elicits findings similar to those already reported, and in addition a possible reference of the lumbar pain to the

right kidney, determined only by change in position. Pain over the appendix still persists, though the character of the two seems even more distinctly differentiated, the latter being much the more sharp and stabbing. Diagnosis: Appendicitis and possibly a floating kidney.

October 11th.—Patient again seen in consultation with Dr. Harte. Pain over right lumbar region and abdomen much increased by examination of previous day. Temperature, 99° F.; pulse continually over 80; respiration normal. No indication of a suppurative process.

Blood examination showed: Hemoglobin, 100 per cent; red corpuscles, 4,700,000; white corpuscles, 10,000. Diagnosis confirmed and operation for appendicitis decided upon.

Patient removed to hospital in carriage. During the night had a slight chill and continuous attacks of vomiting, evidently due to nervous apprehension. No change in physical condition.

October 12th.—The patient was easily anesthetized with ether and was operated upon by Dr. Harte about 2 P.M. Appendix removed. Before removal two soft concretions (fecal) were expressed into the bowel.

The subsequent history of the case was without event from a clinical point of view. The wound promptly healed and at the end of two weeks the patient was transferred to her home, sat up in her chair, and from this point on proceeded with on uninterrupted convalescence.

As a matter of routine the appendix was examined and the following notes were made:

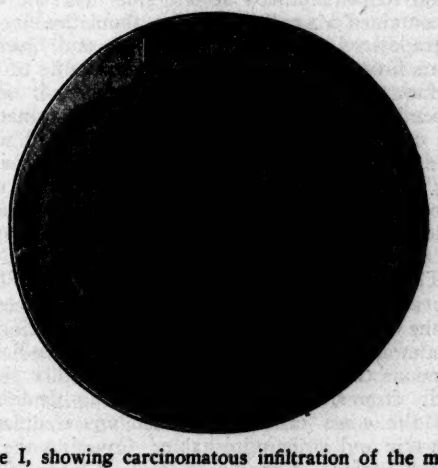
Length from the extreme tip to the intestinal opening, 15 cm. No adhesions at any point. No constriction; no new growth visible; no solid concretions present (two small, soft concretions having, however, been expressed into the bowel at the time of the operation). The appendix lay behind the cecum, and pointed upward and to the right. At no point was there any indication of suppuration or the beginning of adhesion formation. No enlarged glands were palpable. Bowel mesentery, and peritoneum all appeared normal. Except for the great length and a slight twisting upon itself as it lay in the abdomen, the appendix appeared normal to the eye. The lumen was, however, closed for almost the entire length of the organ.

Microscopical sections were made from five different localities. That immediately adjacent to the bowel showed a lumen still patulous. There were evident signs of a high degree of inflammation, a marked proliferation of the glandular elements, and considerable round-cell infiltration. About 1 cm. from the opening into the bowel the lumen had already disappeared, and the tissues were in the first stages of a necrotic process. A few of the glands of Lieberkühn still persisted, and many round cells were to be seen; everywhere, however widespread necrosis.

From this point to within 1 cm. of the tip of the appendix there was no lumen. The tissues became more and more necrotic as the tip was approached, until all traces of the mucosa and submucosa were lost.

About 1 cm. from the tip of the organ, and over a distance of about 0.5 cm., sections were obtained that showed an extensive carcinomatous infiltration of the scirrhous type. Nothing was to be seen in this area macroscopically other than an appearance identical with that on each side of the new growth, where no signs of malignancy were to be found. Starting in the remnants of the glands in the old mucosa, columns and nests of large ovoid and round epithelial cells arranged themselves through all the coats of the appendix, reaching even the serosa, and at certain points extending into it. The area formerly occupied by the lumen was altogether taken up by the necrotic mass, throughout which ran in every direction small columns and nests of the same epithelial cells. The nuclei of the latter stained intensely with hemotoxylin. The blood supply was fairly good in the portions of the appendix that were not necrotic.

FIG. 1.



Case I, showing carcinomatous infiltration of the muscularis, etc.

On both sides of this microscopical area of tumor formation the sections showed absolutely no malignant infiltration. The lumen, however, was completely gone, and the centre of the organ was occupied by necrotic tissue as in the proximal portions. At no point was a foreign growth macroscopically apparent, either within or without the appendix.

A second case, also reported for the first time, and similar in many respects to the preceding, came to the attention of Dr. Robert G. LeConte, in his service at the Pennsylvania Hospital, and we are indebted to him for permission to publish the clinical history.

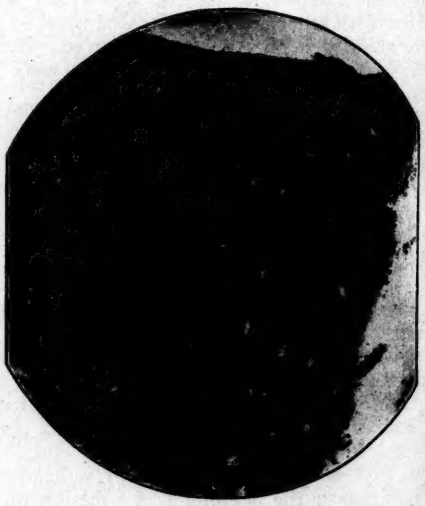
Case II.—Frank L., aged twenty-five years, grocer, was born in Russia, and as a child was always well and strong. No history of malignant disease in his family. Father and mother living and well, also several brothers and sisters. Pa-

tient had none of the diseases of childhood, and until one year before admission to the hospital had never been ill. No history of trauma of even the slightest nature. Eight months ago experienced pain in the abdomen, often localized in the right iliac region, and described as cramps. Never had either diarrhea or constipation. Never at any time was blood noted in the stools. The attacks of pain were increasingly severe and intermittent until they led the patient to ask hospital advice. During the preceding eight months had been under the care of a physician for the pain already mentioned, but had obtained no relief. On November 11, 1901, his present attack had lasted two days, and was of the same indefinite cramp-like nature, localized mainly in the right iliac region. The physical signs were those of an acute attack of recurrent appendicitis in the third day. A mass could be felt in the right iliac fossa, with the gut overlying it.

Operation, November 15, 1901. Incision at McBurney's point. Appendix was beneath the cecum and bound down in the pelvis, and was found to be ruptured at one side near the tip. It contained a small concretion about the size of a grape-seed. The end was thick and fibrous. Some brown fluid with a fecal odor came to the surface when the peritoneum was opened. The appendix was excised and the stump invaginated, the cavity and space around being packed with iodoform gauze. On November 18th the packing was removed and the patient's condition was good. The outer packing was removed at a later date. A sinus formed and was treated at first in the wards and later at the dispensary.

The following report was made by Drs. Flexner and Longcope upon the appendix removed at the operation: "Diagnosis, primary carcinoma of the appendix; acute suppurative appendicitis. Sections through the wall of the appendix about 1 cm. from the tip show the following condition: All the coats of the appendix are completely necrotic and indistinguishable. Covering the internal surface of the appendix is a mass of necrotic material, fibrin, polymorphonuclear leucocytes, and fine fibrin threads running in all directions. On approaching the peritoneal portion of the appendix the fibrin threads become denser and the leucocytes fewer in number. Epithelioid cells began to appear, and still nearer the peritoneal portion become more and more prominent, assuming an elongated character, until finally the tissue presents the appearance of newly-formed fibrous tissue, infiltrated with a moderate number of polymorphonuclear leucocytes, and clumps of small round cells. In the deeper portion of this tissue is an area containing numerous irregular alveoli of epithelial cells. Some are long and narrow, filled by only two or three rows of cells; others are large, irregular, and packed with many cells. The connective tissue between these cellular masses varies markedly in amount, here and there predominating in the section or sometimes only separating the cell nests by a few fibers. The individual cells are polygonal in shape, with a small rim of palely-staining protoplasm around the nucleus, which is usually oval and vesicular. No nuclear figures are observed. The tip of the appendix is seen to be the point of origin. The surface epithelium is here intact, and except at one point the glands of the mucosa are normal in appearance. The mucosa is here thickened, and scattered through it are small, irregular masses of cells identical with those already described in the other portions of the appendix. The cells at the periphery of these nests in the mucosa are of a high columnar type, with oval vesicular nuclei; but toward the center they become polygonal, with large round or oval palely-staining nuclei. No basement membrane is present. Irregular projections of carcinoma cells extend from these islands of new-growth between the greatly swollen lymphoid follicles and infiltrate with a

FIG. 2.



Case II, showing origin of the growth from the glands of the mucosa.

diffuse growth the deeper portions of the mucosa. The muscular coats are slightly invaded. In other portions of the appendix small areas of new growths are found lying in the submucosa, the muscularis mucosa separating the growth from the mucous membrane in all instances, and thus demonstrating their secondary nature.

The patient was examined by one of the writers, through the courtesy of Dr. LeConte, about February 1st, at which time scar was healthy and the patient was wearing with comfort an abdominal belt. On palpation the abdomen was absolutely normal, except for a hard nodular mass to the right and below the old scar. This the surgeons deemed to be a formation of fibrous inflammatory tissue. In March, 1902, he was admitted again to the hospital with symptoms of obstruction of the bowel. Operation was performed and a fibrous band of adhesion was found occluding the bowel above the cecum. The in-

testine was nearly gangrenous at this point. Death occurred on the same day. At the time of operation there were no discoverable signs of recurrence of the malignant growth. No autopsy was permitted.

It may be well at this point to review the literature upon the subject, and where possible to compare similar cases with the two immediately under discussion. Most striking in the few cases on record has been the absence of any symptoms that would definitely point to the condition actually present. It has already been stated that only in a very small number of all the reported cases of appendicular carcinoma has the process been limited strictly to the organ; but in the few that have been similar in this respect there have invariably been present indefinite symptoms only, and such as belong to an appendicitis of the usual type.

We can find, after a careful search of the literature, only sixteen other cases of carcinoma probably limited to the appendix, and, as previously mentioned, even in some of these it may well be questioned whether the growth was actually limited to or even primary in the organ. Of these A. O. J. Kelly[1] reports two, E. Hurdon[2] one, Letulle and Weinberg[3] two, Rolleston[4] one, Mosse and Daunic[5] one, Wright[6] one, Leichtenstern[7] three, Nothnagel[8] one, Maydl[9] one, and Goffe[10] one. To several of these Kelly has already called attention in his discussion of the tumors of the appendix. In Wright's case there was extensive suppuration in addition to adhesions, and a perforation near the juncture with the bowel. In a third case reported by Kelly, and not included in this list, there was the same picture of suppuration and adhesions, with a miliary studding of the bowel and peritoneum by the growth—probably secondary to disease elsewhere in the body. But in all the cases that we have submitted the symptoms were those of an ordinary relapsing appendicitis, and in none was the actual condition suspected. A few resembled the cases reported in this paper in the complete absence of a tumor evident to the naked eye. In several instances a small tumor was present that was usually mistaken for a concretion within the lumen of the appendix until the latter was laid open.

A number of other cases will be referred to in the bibliography at the end of this article in which the appendix was involved, and perhaps primarily, but in which also the possibility existed of a different location for the original focus of the disease, and in which certainly the process was not limited to the appendix at the time of operation. Cases in which there has been present also an involvement of the uterine appendages, or of the intestines, or of the peritoneum, can hardly be looked upon as even probably originating in the appendix itself, and cannot, therefore, be considered as among the conditions to be included as primary carcinomata limited to the organ.

As a matter of record and comparison an abstract of the cases reported by Goffe, Kelly, Hurdon, Letulle and Weinberg, and Rolleston will be of interest. That noted by Goffe bore a striking resemblance to the two cases primarily emphasized in this paper.

A young Jewess, aged fifteen years, unusually well developed and well nourished. For more than a year has had increasing pain in the appendicular region, caused by any ordinary exertion. Diagnosis, chronic appendicitis, and operation advised, although no tumor was palpable. The possibility of involvement of the uterine appendages was reserved. Operation, December 4, 1900. The appendix was found to be unusually long, thickened, and tortuous. At the extreme tip could be seen through the peritoneum a round white body the size of a large narrowfat pea; this felt to the finger like a calculus. On section it appeared macroscopically like a fibroid tumor, and evidently had developed in the tissue between the mucous membrane and the peritoneum. The pathological report stated: "Acute appendicitis throughout the organ, no evidence of chronic inflammation discoverable. A small spherical nodule, 5 mm. in diameter, was found at the extreme tip, which upon microscopical examination proved to be carcinoma of quite a typical character. The growth appeared to intrude wholly upon the lumen of the appendix, the muscular coat remaining unaffected except," etc. The patient's grandmother died of carcinoma of the uterus, her sister of carcinoma of the breast; there was no other malignant history in the family. The patient convalesced promptly and has been entirely relieved of her former symptoms.

Kelly's cases showed the following features:

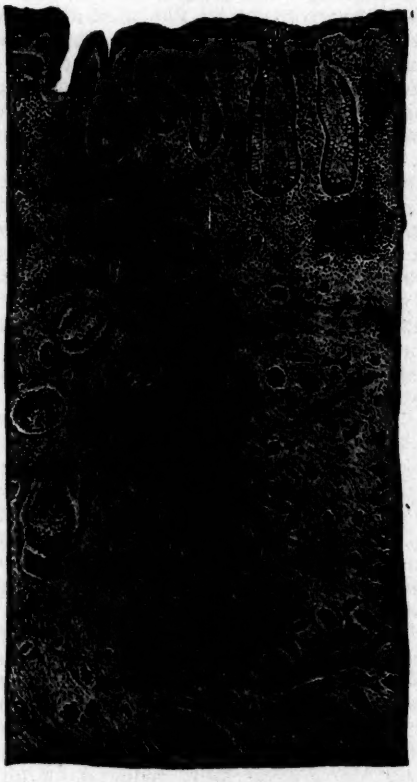
Case I.—Clinical history lost. Appendix removed by operation February 19, 1898. Length of appendix, 11 cm.; exterior diameter at proximal end, 8 mm., this being maintained for about 3 cm. Then it increases to 1.2 cm. and continues so throughout the remainder of its length. The organ is irregularly distorted, and the wall of its proximal two-thirds is of a greenish hue, soft and necrotic. The lumen measures 4 mm. at the proximal end, and gradually decreases to 1 mm. at the tip; the mucous membrane much congested and ulcerated toward the proximal extremity. Toward the tip the inflammatory phenomena are much less marked. The lumen contains a small amount of mucopurulent material. Cultures showed a pure growth of colon bacilli. The microscopical examination showed a high grade of ulcerative appendicitis, and at the distal portion an area of tumor formation about 6 mm. in diameter, involving only the mucosa and submucosa. Slight persistence of the glands of Lieberkühn. Diagnosis, carcinoma. Cells polyhedral, some large and ovoid. Solid masses of cells in alveoli.

Case II.—Man, aged nineteen years; family history negative; previously well. Eight days before admission seized with cramp-like abdominal pain. On the third day vomited a small quantity of frothy mucus, and pain became localized to the right iliac fossa. Pain relieved by flexing right

thigh. Some abdominal distention and tenderness in right iliac fossa, marked rigidity of right rectus muscle, an area of dulness on percussion, on palpation a mass about three inches in diameter in the right iliac fossa. Temperature, 102° F.; on next day, 103.2° F. At the operation on the next day the head of the colon and the appendix were found surrounded with pus, which was evacuated and the appendix removed. Recovery.

Pathological Report: Appendix, 5 cm. in length, and about 1 cm. thickness throughout its entire extent, much congested and inflamed and covered with fibrino pus, much distorted; microscopically, lesions of ulcerative appendicitis, and toward the base of the appendix a small growth,

FIG. 3.



"which in the cross section occupies hardly three-fourths of the microscopical field of an AA Zeiss objective and a No. 2 eye-piece." Situated entirely within the submucosa, the mucous membrane being nearly intact, are solid masses or nests of cells, some relatively large. The cells are epithelial in type, of moderate size, and their nuclei are vesicular and stain well. In some sections there is a slight infiltration of the muscularis.

Both of the foregoing cases seem to be genuine examples of a limitation of the new-growth to the walls of the appendix, and through the kindness of Dr. Kelly we have had the opportunity of comparing his sections with those from our own cases. The purulent effusion in his second case seems to indicate at least an extension of the inflammatory processes to adjacent and surrounding structures.

Much more typical even of the ordinary appendicitis is the description of the following case reported by H. D. Rolleston.[4]

Woman, aged twenty-six years, in her fourth attack of appendicitis, the first having occurred in January, 1899, and the last on March 26, 1900. The appendix was removed on the following day (March 27th). No account is given of the clinical symptoms nor of the physical signs; simply the statement that they were those of an outspoken, relapsing appendicitis.

The appendix showed slight peritoneal adhesions connecting the apex of the organ with the posterior surface of the uterus. No enlarged glands were present, nor was anything that suggested a secondary involvement seen at the time of operation. When the appendix was cut open a globular mass a little larger than a marble was found near the apex, arising from the mucous membrane, somewhat caseous in appearance and suggesting tubercular disease. Patient recovered from the operation, but during the middle of April had erratic temperature, with some pain in the left side of the abdomen. This subsided, and she went to a convalescent home in May. News was had recently (June) that the patient was losing flesh, and possibly secondary growths were developing in the abdomen.

Examination of the appendix unexpectedly showed the growth to be a spheroidal-celled carcinoma, limited in portions to the mucous membrane, and elsewhere extending to the muscularis and almost to the peritoneum. There was no extraperitoneal involvement.

This case resembled those reported by Kelly, and showed in a still more marked manner the limitation of the growth and its point of origin. The tumor was evident macroscopically, but only after the laying open of the organ. The clinical picture was not given in detail, but was undoubtedly one that suggested nothing more than a chronic catarrhal condition of the appendix.

E. Hurdon's[5] case, seen in the service of Dr. Howard A. Kelly, goes a step further in the similarity of the clinical pictures, and again presents a growth that was discovered only after removal from the body.

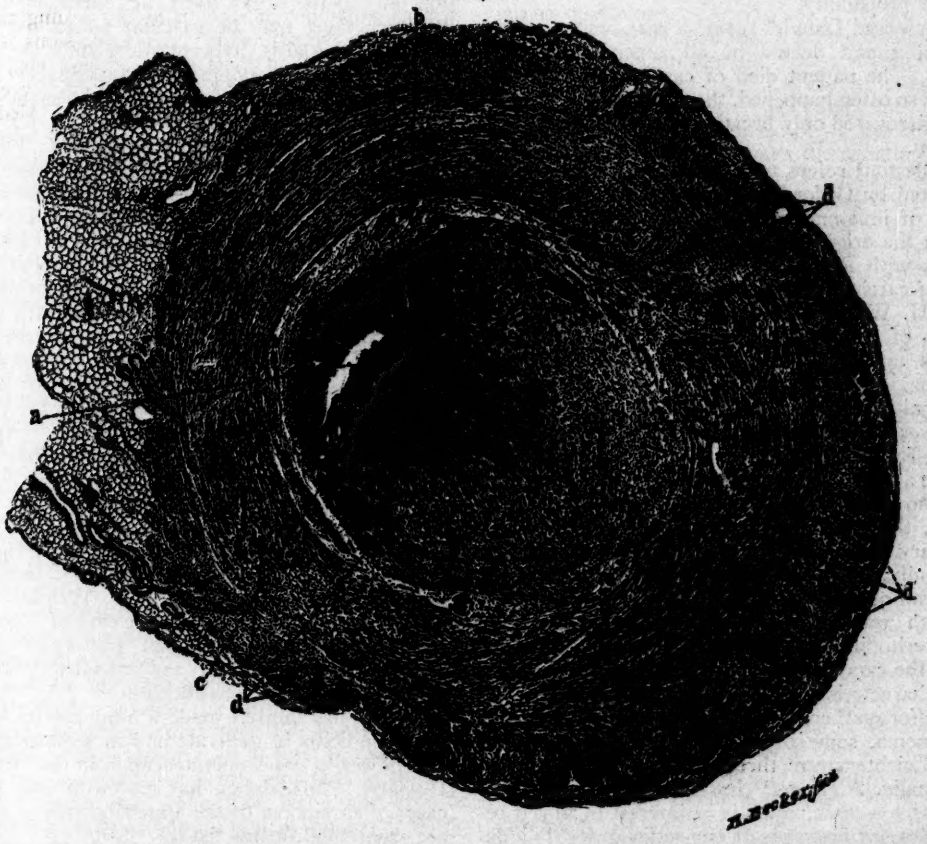
Woman, aged twenty-four years; married nine years; II-para. One brother died of carcinoma of the leg. Patient always well until birth of first child; then at varying intervals experienced pain in the back and abdomen. This was a dragging nature. Last spring she had a fall, and the pain, which had been limited to the pelvis, now became more marked, and was situated higher up in the right iliac fossa. Right kidney palpable and slightly movable. Uterus in acute retroflexion; its mobility restricted. Further examination negative.

At the operation (February 21, 1899) Dr. Kelly released the pelvic adhesions, suspended the uterus, and removed the appendix. The uterus

and tubes were bound down, especially on the right side. No cause discoverable for pelvic peritonitis until the appendix was found hanging into the pelvis, enveloped in dense vascular adhesions. A shortened meso-appendix caused the outer third to redouble on the inner portion, and at the point of flexion there appeared to be a foreign body in the canal. The appendix was amputated close to the cecum. Uneventful recovery.

In December, 1899, the patient had gained twenty-three pounds, and her general health was of flexion there appeared to be a foreign body in right lumbar region, evidently due to the movable condition of the kidney. In May, 1901, more than

FIG. 4.



two years after the operation, Dr. Hurdon writes: "The patient is enjoying good health and shows no evidence of recurrence."

The appendix was 10 cm. in length. About the juncture of the middle and outer thirds it was flexed within a broad band of adhesions. Proximal end normal. The portion beyond the flexion was distended, and contained a soft concretion about the size of a date-stone. Also a small tumor, in the form of an oval swelling, impinged upon the canal, and appeared to the naked eye about 1 cm. long and 5 mm. broad. The cut surface showed a whitish appearance. Under the microscope the growth was seen to be the ordinary type of glandular carcinoma that is so customary in the mucous membrane of the bowel.

This case bears a great resemblance to the first one that has caused the writing of this article. Not only the clinical history, but the special lumbar symptoms referred to a floating kidney, and the flexion of the appendix showed striking similarities. The two cases differ absolutely in the presence and absence of adhesions and surrounding inflammation, carcinomatous or otherwise. Both were in women in their twenty-fifth year.

Letulle and Weinberg[3] report twelve cases of obliterative appendicitis from their histological aspect, among which they unexpectedly found two cases of carcinoma developing at the level of the cicatricial obliteration of the tube. In neither case did a malignant growth enter into the discussion as worthy of consideration prior to the microscopical examination. The foregoing instances will suffice to show that cases do occur in everyday practice, and in all classes of life, which, while simulating appendicitis in their clinical features, may all the time constitute the manifestations of a malignant growth that is gradually making headway toward a fatal involvement. A. O. J. Kelly[1] has called attention to the fact that out of 20,480 autopsies performed in the Allgemeinen Krankenhaus in Vienna for the twelve years from

1870 to 1881, there were 1,460 cases of carcinoma, of which 100 affected the intestinal tract, and of these only one involved the vermiform appendix alone (Maydl[9]). Also to the statistics of Nothnagel,[8] for the same institute, from 1882 to 1893. During this time 20,358 autopsies were made and 2,124 cases of carcinoma noted, of which 243 were of the intestinal tract. Only one affected the vermiform appendix.

Whipham[10] reports a case of extensive involvement of the intestine and peritoneum, which he believes to have originated primarily in the appendix. He notes an ovarian involvement, which he speaks of as "probably secondary," in spite of the fact that the reverse would be the natural order of probability.

Mosse and Daunic[5] report a case limited to the appendix and devoid of all appendiceal symptoms. The patient died of cardiac disease, and, as has so often happened, the appendicular growth was discovered only because of the routine examination.

Rolleston[4] refers to a growth of the appendix reported by Gilford[11] as having been probably a mass of inflammatory tissue and not malignant. From the original description we are inclined to think, with Rolleston, that the case was neither one of carcinoma nor sarcoma, as claimed.

J. H. Wright,[6] however, has published an account of a case seen by him that undoubtedly comes under the heading of appendicular carcinoma. The clinical history was one of purulent peritonitis of obscure origin. The autopsy failed to reveal any definite starting point for the purulent effusion.

The appendix showed some adhesions, but there was no evidence of perforation. As a matter of habit, the appendix was sectioned and a "small primary carcinoma" found in the head of the appendix. "At the junction of the tumor with the wall of the gut" a perforation was then found "which was undoubtedly the starting-point for the peritonitis." The muscularis was infiltrated with the cancer cells, and the tumor followed out the characteristics of an adenocarcinoma.

Lafforgue[12] collected nine cases of appendicular carcinoma, some of them of doubtful accuracy, and Leichtenstern[7] three cases.

Finally, A. Beger[13] has reported a case from Thiersch's clinic which is of interest in that it resembles our first case of our series in its slow development, though when the appendix was removed the tumor had attained to a large size and was no longer limited to the appendix.

Man, aged forty-seven years. A mass was evident in the right iliac region for three and one-half years. Severe pain. On incision one liter of odorless pus was evacuated. The opening would not close, a fistula formed, with exuberant granulations around it. No digestive symptoms other than constipation were present.

The physical examination showed a tumor the size of a fist over the appendix; the surface of the abdominal wall was lacerated. A small portion of the tumor was excised and examined. Diagnosis, adenocarcinoma of the intestine. The appendix was 6 cm. long, finger thick, the peripheral end much enlarged. The serosa was nowhere perforated by the growth. The wall showed inflammatory hyperplasia, the central portions forming an abscess wall and surrounding the purulent collection in the new-growth. The patient died. At autopsy there were found to be present also a general peritonitis and a carcinomatous infiltration of the glands.

If we would summarize, we obtain the following facts and figures. By extending the meaning of the term "limited to the appendix" to include all cases in which there is distinct evidence of tumor formation only in the organ itself, *i.e.*, including cases in which there may be vascular adhesions, suppurative peritonitis, hyperplastic glands, etc., but not yet a true development of malignancy elsewhere than in the appendix, we are enabled to classify under the above heading as follows: Nothnagel,[8] 1; Wright,[6] 1; Maydl,[9] 1; Letulle and Weinberg,[3] 2; Leichtenstern,[7] 3; Mosse and Daunic,[5] 1; Kelly,[1] 2; Hurdon,[2] 1; Rolleston,[4] 1; Ziemann,[14] 1; Goffe,[10] 1, and the present cases 2; in all 17 cases. Of these several might easily be called into question, reducing the number still further if a rigid line were drawn; for in exceptional instances only is mention made of a thorough examination of the abdominal contents for other foci of malignancy. As only a small number have as yet given an opportunity for study on the autospy-table a statement as to the probable limitation is all that can be made. Even if we include cases in which the appendix has been *chiefly* concerned, and in certain of these by an admittedly secondary involvement, we can find only in the neighborhood of 30 cases all told. Kelly has called attention to those of Merling,[15] Rokitansky,[16] (4), Prus,[17] Beger,[13] Draper,[18] Stimson,[19] Mosse and Daunic,[5] Wright,[2] and Cullen.[20] Also to a questionable case of Monks.[21] We have already mentioned Lafforgue's nine cases of which several are included with no propriety in such a classification.

Kelly[22] has himself made a most careful study of appendicitis in general; and in sectioning 706 appendices in cases operated upon in the German Hospital, Philadelphia, has met with only three cases of carcinoma of the appendix, two of which are mentioned in this list.

These figures indicate that the condition is decidedly rare, and yet we are inclined to attribute to it much more clinical importance than would at first seem to be warranted. In the first place, appendicitis has been considered an operative condition for too short a time to afford opportunity for a thorough study of the relation of malignancy to its etiology, even had advantage been taken of every occasion for microscopical examination, which is far from having been the case. Only during the past two or three years has there been any careful histological study of appendices after their removal on the operating-table; and even now it may almost be said that nine ap-

pendices out of ten are destroyed without microscopical study. The fact is a pregnant one that out of the thirty and odd cases fully two-thirds of the number have been discovered since 1890; and of the 17 cases that we admit into the number of those probably limited to the appendix, all except one have been noted since 1895, and 10 since 1898. *Of the latter* 10, 6 *have occurred within the last eighteen months.* All of these facts point to one conclusion. As the custom grows of examining microscopically every bit of pathological tissue that leaves the operating-table, we find much more frequently conditions that have been considered rare. Five years ago an appendicitis was either acute or chronic; then it became catarrhal, ulcerative and obliterative. Now room has to be made for carcinomatous appendicitis, or perhaps more accurately, "inflammatory carcinoma" of the appendix. This leads us directly to a discussion of the origin of the growth in the appendix, and from that point still further to the clinical aspects of the condition.

First of all, what may be the *cause* of a primary carcinoma of the appendix? The many theories applied to the causation of carcinoma in general of course come readily into view; and as each advances it must be promptly set aside until we arrive at last at a point between two possibilities, neither of which can as yet be definitely established. Taking for example our own case as a fair one for consideration, we must pass over at once the congenital theory of Cohnheim as impossible. Trauma is not to be considered in the case. Heredity can have no place. The age itself was against malignancy; and certainly there was no true tumor dyscrasia in a case that had required five years or more for the development of a microscopical tumor, although the interior of the entire appendix was necrotic. So that we come naturally to the only two remaining theories; the one of a parasitic infection, and the other of an inflammatory overgrowth of the epithelial structures, accompanied by a perverted metabolism that evenually must result in both an extension of the growth and a poisoning of the system. To assume the former as the correct theory we must admit that the parasites were present in the appendix, or at least in the system, for not less than five years, and that at the end of or during that time they were only able to form a growth so minute that it still required the microscope for its discovery. This theory at the same time implies the presence of animal organisms that can survive during five years of combat with the fluids of the body, and yet are at a standstill as regards their own multiplication, a thing that is hard to conceive in the light of our present knowledge of the manners and customs of pathogenic bacteria and protozoa. We make this statement in the full knowledge of the fact that during the past few months a new parasite has been offered to the medical profession as an explanation of the origin of malignant disease. Much more logical seems the sequence from a primary inflammation (especially in our own case) and a carcinoma secondary to or developing out of it, than a primary carcinoma and a secondary inflammation.* Moreover, the improvement that constantly follows operations in cases of malignant disease, even though temporary, supports this theory, while at the same time rendering less plausible one of a parasitic origin. The removal of the focus of active inflammation will retard and perhaps cause to cease temporarily, or perhaps permanently, the exaggerated proliferation of epithelial structures. Whereas the same active procedure, except in the way of removing unhealthy tissue, would only offer new and perhaps, up to that time, uninvolved surfaces to an infectious process, by virtue of the progress of the knife and the shock involved in all major operations.

If it once be allowed that a simple inflammation may have been present for years, whether catarrhal or of any other type, it is easy to imagine its semiquiescence during that time, until at last during an unusual disturbance of the bodily or local nutrition it breaks down the resisting power of the tissues, as so frequently happens in other portions of the body. This dormancy we cannot so easily assume for carcinoma, once it is developed in the body. We must consider, however, the possibility of a chronic inflammatory condition, long present, that has so depleted the resisting power of the appendicular structures that the latter finally become susceptible to a passing infection. It will no doubt be claimed that in such a condition the objection that the carcinoma parasite, in order to have had any influence, must have remained idle for many a day, becomes groundless; and that if there is indeed such a thing as a causal parasite, now is the time when it will most likely exert its influence should it happen to be present at this particular period. Such an argument is impossible of definite answer, because it states only a possibility. The assertion, however, carries no weight of probability with it; and at least to our minds the theory of an inflammatory origin offers so much more simple and likely an explanation that it seems unnecessary to go out of our way to search for a causal organism. After all is said, the most telling argument against the parasitic theory is the failure of such growths to show a predilection for metastasis through the circulation, rather than by direct extension. Metastases do occur in this way, but by no means so often, and we do not need to go to greater trouble than to examine the blood repeatedly in such a case in order to find there cells that have left the mother focus, which by their very nature must spread the unwholesome influence, whatever it be, to the tissues that form their lodging place. Moreover, Dock's studies

*After this article was in type the writers saw together a case that bears directly upon this point, in a woman who had suffered for years from ovarian colic, with a vague history of an attack of appendicitis twelve years before. At operation a cystic ovary was removed and a thick short appendix that had evidently been the seat of repeated attacks of inflammation. In the tip of the latter a small tumor was observed, encroaching upon the lumen, which on microscopical examination proved to consist of inflammatory connective tissue. No malignant change could be detected. The mucous membrane had disappeared from almost the entire lumen of the appendix.

(*Amer. Jour. Med. Sc.*, June, 1897) have recently shown that many of the cells previously considered as "carcinoma cells" can be caused to appear on the pleura and other structures by exciting simple inflammatory processes; and that neither these nor cells from a carcinomatous mass can be distinguished from ordinary epithelial structures except when found in mass and in typical arrangement with others of their kind. Bacteria or sporozoa or fungi may be carried too, and no doubt often are, in the circulation; but that there is a specific organism in and behind the new process seems highly improbable, and still less likely of demonstration. Ribbert (*Deutsche med. Woch.*, Nov. 21, 1901) takes the ground that parasites play no part in the development of a carcinoma after the primary irritation and inflammation have been set up in the connective tissue. By means of this inflammation the organic relation between the epithelium and its basal structures is severed, and the epithelium thus becomes, apart from its need for nourishment, independent of the body. This stimulates at once its natural and independent tendency to proliferate. He then adds that possibly there may be a specific micro-organism causative of the primary connective-tissue inflammation, but that its influence does not extend to the proliferation itself. This is as much as to admit (and we hold this as the most likely solution of the question) that any micro-organism may start an inflammatory reaction under certain circumstances, which, under favorable conditions, may develop into carcinoma. There are perhaps few, if any, malignant growths that do not yield cultures of the ordinary pyogenic organisms. Probably these find a favorable nidus at a time when the tissues, owing to one cause and another, are non-resistant and simply take advantage of their opportunity. Von Marschalko* holds that the so-called plasma cells (which are probably nothing more or less than fibroblasts) in certain conditions undergo hyalin change and present the forms that have been named cancer parasites by many writers. This again coincides with our view; as the plasma cells have been shown to be most probably derivations from the lymphoid cells, and the latter, as is well known, are found massed around old and chronic inflammatory foci, sometimes to the exclusion of the polymorphonuclear variety. The boundary between hyperplasia and malignancy is at best a very narrow one, and when the epithelial tissue is ready at hand, as in the mucosa of the appendix vermiformis, it needs only the torch to light up a conflagration such as we may here picture. Grant also a necrosis already under way in the surrounding tissues, and a consequent refusal to supply assistance in the form of nourishment for the diseased structures, and there is nothing left to hinder the epithelial bands from forcing their way in every direction into the surrounding unprotected territory. Proliferation is as natural with epithelium as mischief-making with the pyogenic organisms, and, only allowing that the surrounding tissues are devoid of their native resistant energy, the irritated epithelium may be expected to advance in its overgrowth as promptly as the barriers are let down. Apart from the local condition the first patient considered in this paper was in superb physical trim. Even at the time of the operation her muscular development was one to be envied, the blood picture unusually good, and not a bodily function disarranged. Evidently in such a case even a malignant growth must choose a slower gait than is its wont. It is well known, moreover, that intestinal carcinoma pursues a slower and, if the expression may be used, a more benign course than that of other portions of the body. But that it can lie dormant for the time required in this instance, and be discovered at last only by accident, is more than one should be asked to believe. Nor is it conceivable that a specific organism, at work for even a short time, not to mention five years, could fail to transmit others of its species, as well as its toxin, to other portions of the body. And yet not a single gland in the abdominal cavity could be palpated. Certainly these cases would seem clinically and pathologically to point away from a parasitic origin, and toward a purely inflammatory and hyperplastic beginning of the growth. Had the patient been older, and had the growth been more extensive, and to a degree commensurate with a portion of the time during which inflammatory symptoms were present, the parasitic theory could find ground for resting-place. But with only ¼ cm. of progress in five years, no peritonitis, no enlargement of the glands, no adhesions, a perfect blood picture, and no involvement even of the structures continuous with a chronically-inflamed appendix, the foundation for a parasitic explanation becomes almost as microscopical as the tumor itself.

Our belief is and must be that the original focus was a catarrhal inflammation, probably due either to fecal or other obstruction, or to extension from the bowel, and that the carcinomatous change took place subsequent to and entirely as the outgrowth of the former process.

In concluding our paper it will be interesting to briefly discuss the diagnosis, treatment, and prognosis of the condition.

Can the condition be diagnosed in its early stages? We believe not, unless the ground be taken that every appendicitis presents the danger of malignant disease, and an incision be made for the purpose of diagnosis. Even then, in these cases as well as in those of Goffe, Kelly, and at least one or two others, the only means of diagnosis lay in the removal and microscopical examination of the appendix.

The clinical symptoms were those purely and simply of recurring appendicitis. The patient's age was against carcinoma (it will be noted that in a considerable number of the cases quoted the age has been that of young puberty) and the condition, except for the pain and tenderness, was excellent. The stools were not characteristic.

*Arch. f. Derm. u. Syph., 1900, Bd. lxiv, Heft. 2 and 3.

The urinary examination throughout the entire period was absolutely negative. The blood in the first case was hyper-healthy, if a high percentage of hemoglobin and a high count of red and white corpuscles can be looked upon as a criterion. Only on the last day was there a suspicion of a leucocytosis, though, unfortunately, no differential count is recorded. The absence of an absolute leucocytosis is hard to explain, though it may have been dependent upon a partial lack of power to assimilate the food. Thus, in spite of the presence of necrosis and a malignant disease there was no indication in the blood of an inflammatory process in the system. Equally interesting was the absence of nucleated red corpuscles and poikilocytosis. The mass that seemed to be palpable, clinically, was altogether wanting when the abdomen was opened, and rendered only more astonishing the final discovery under the microscope. The glands were at no point enlarged.

The symptoms, therefore, as well as the physical signs, all joined in pointing to a recurring appendicitis, and had carcinoma been considered, as was not the case, it would have promptly been ruled out as impossible under such conditions of nutrition and development.

Later on in such a case the condition may become plain enough, as in one of the instances quoted above; but the diagnosis then comes too late to be of service. "Either early or of no avail" must be the guiding principle in this as in all other forms of carcinoma.

The treatment, in the light of the above facts, rests itself at once upon two alternatives: Either the radical school of surgery gains a point by finding in this an additional reason for immediate operation as soon as appendicitis is diagnosed and as a prophylactic measure, or else the conservative must lean upon the comparative rarity of the condition.

Some will say that if out of 706 cases sectioned for Deaver by one pathologist only three carcinomata were discovered (beside one sarcoma and one endothelioma of the organ, which do not directly concern us in this connection), the number and danger do not justify a wholesale attack upon the appendices of mankind. On the other hand, we ourselves have been able from the literature of the last five years to collect a number of cases, always increasing in the yearly ratio, and as more appendices are examined it bids fair that more will be found.

The question, therefore, is no trifling one. If a carcinoma such as was found in these cases by accident will later involve the bowel and peritoneum, and certainly cost the patient her life, and, again, if by removal at an early date the operation presents only the ordinary danger of an abdominal section and etherization, then the surgeon has thrust upon him a new responsibility. And when the medical man deliberates in regard to the best mode of procedure, he must think twice before finally deciding to let Nature try her hand in the case. Life obtained at a real but minimum risk and an equally real risk of sure death are the two questions involved in a prompt operation and an expectant treatment. This is a point which, if well taken, changes a conservative into a radical on any question, and we will be surprised if many a medical man, as the number of reported cases of appendiceal carcinoma increases to greater proportions, does not leave the ranks of the expectant ones and proceed to prompt and thorough measures.

No ice-bag and no sedative treatment, nor even rest in bed, can either retard or destroy the carcinoma when once present in the appendix. And though cases of simple appendicitis have undoubtedly recovered and lived whole lives without a recurrence, no one, we now know, can tell whether the case is one of simple appendicitis or carcinoma. If the one, it may recover without operation; if the latter, the patient will die unless operated upon. And the only way to ascertain which she will do is to open and remove the growth if there, and the appendix, whether a carcinoma be evident to the eye or not. The duty to the patient ranks in advance of the fear of the result, and if left to the patient's own decision, the facts being fairly presented, the abdomen will be opened. Provided now an operation has been decided upon, and either upon the operating-table or later in the laboratory a malignant condition of the appendix be found, what shall be our course of procedure, even if the abdomen shall have already been closed before the growth is discovered? This question can only be settled with regard to the extent of involvement, the presence of metastases, or the infiltration of surrounding tissues. The abdomen should, at any rate, again be opened, and if the growth be microscopical, or even macroscopically evident, and yet have not, as far as can be ascertained, been transmitted beyond the appendicular walls, we believe the proper procedure to be the removal of the appendix only. Warren,[23] in a similar case (sarcoma of the appendix), extirpated the cecum and a portion of the bowel on each side of the latter. The treatment is radical, and errs, if at all, in rendering the operative procedure more grave and extensive. Here, however, we must consider, in conjunction with the gravity of the surgical measures, the prognosis as it stands without such procedures. If the simple removal of the appendix with a growth which, to the best of our knowledge, involves only its own structures, presents a fair probability that the latter may never recur, then our duty is plain. If, on the other hand, a greater degree of safety is assured by a more extensive operation, a simple appendectomy is not to be considered. As yet we have neither statistics nor experience to help us in our decision, and the writers can only say that in such a case as that reported in this paper the less serious of the two procedures would seem to them to be indicated in the light of their views as to the pathology of the malignancy of the appendix. A new question is at hand immediately the bowel becomes involved or as soon as adhe-

sions, adenitis, and peritonitis make their appearance manifest.

Our own experience as well as that of others whom we have consulted covers absolutely no cases that have been diagnosed as such while still limited to the organ, or which have been observed for a sufficient time subsequent to the operation to warrant an opinion as to the certainty of cure or recurrence. If the growth were as small when removed as in the present instances, it would require considerable time for it to recur in such force as to give decided symptoms, especially as the bowel seems preeminently a favorable site for early operation upon carcinomatous growths. If our argument hold good, however, in regard to the sequence of causation of the tumor, we see no reason why, if removed while still limited to the appendix, the growth should ever recur. Where the growth is microscopical in the appendix, an extension would probably also be microscopical for some time. But it is equally true that the smaller the growth —and therefore the younger—the less likelihood there is of an extension having taken place, if we judge from the general rule followed by carcinomata; and the smaller the area involved the less likely the prompt recurrence if seasonably removed. We find by inquiry many opinions that differ on the point, however, and some distinguished authorities speak of the prognosis as certainly bad. Only time will tell. Of course, with the growth of vascular adhesions, the presence of a peritonitis, of a perforation, or of an extension directly to adjacent or contiguous structures, the prognosis assumes a character that is as certain as it is grave.

Up to the present time the whole subject is a new one, but it promises not only to throw light upon the well-trodden though dim path of carcinoma research, but to revolutionize the treatment and prognosis of appendicitis, provided only that the systematic examination of all diseased appendices causes an increase in the number of similar cases proportionate with that of the past semi-decade. Hurdon's case, as has been noted, is "in good health" in the beginning of the fourth year after operation.

The case first considered in the paper also has had an absolute recovery, as far as can be known at the present time, now eighteen months from the time of her operation. She has gained in weight, is absolutely free from lumbar and abdominal pain, and, except for the remembrance of the many dreary months of suffering, seems only the stronger and more active for all she has endured. The outcome of her case should definitely establish not only the prognosis but the treatment, at least in similar cases, and we shall consider it both a privilege and a duty to publish the result at a later date.

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ANURIA. CLINICAL MEMORANDA IN THE OBSERVATION OF A CASE.[1]

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IF one considers of what tremendous and far-reaching importance the excretory function of the kidneys, or, more properly said, the absence of this excretory function, is to the human organism, the gravity and successful issue of the case about to be reported will be readily appreciated.

It is well known to everybody that the subject of the surgery of the kidneys, in spite of its youth, is at the present date fairly clear in most, if not all, of its details. From the chemical and microscopical examination of the bladder urine, and from other well-known diagnostic aids, as well as the anamnesis, we can frequently make the diagnosis of disturbed kidney function. More recent discoveries, as urethral catheterization, the cystoscope, Harris's segregator, the kryoscope, the phloridzin test, will enable us in a majority of instances to differentiate also between the condition of the two kidneys. When the diagnosis is made, past experience and judgment will also quickly indicate the therapeutic procedure. If however, we wish to utilize this knowledge and experience to the consideration of a case of anuria, I very much fear that from the very nature of the lesion nothing definite will result; in a majority of cases only a guess, and in the easier cases only a good guess.

Cases of total anuria, while not extraordinarily rare, are still of sufficient rarity to merit the publication of all cases. In view of this fact, and

[1] Read before the Surgical Section of the New York Academy of Medicine, Feb. 20, 1902.

in view of what has been said, the publication of this case has been decided upon.

The history of the case is as follows: Mrs. Clara S., a native of Roumania, was admitted to Mount Sinai Hospital on March 5, 1901, about 9 o'clock P.M. Patient has been a resident of the United States for seven months; married one year, and has never given birth to a child. One year ago patient had an attack of "malaria"; she was then perfectly well till six months ago, when she again developed "malaria." History of irregular, almost daily chills and fever. At about this time also she aborted, after a pregnancy of approximately two months. Since that time she has been perfectly well with the exception of more frequent micturition, which, however, she ascribes to her present pregnant state.

Three days ago the patient was suddenly stricken with very severe pain in the left hypochondriac region; on the following morning she had a chill of ten minutes' duration, followed by a rise of temperature to 102° F., and by sweating; in the evening of the same day, a second chill of fifteen minutes' duration, with intense pain in the left hypochondriac and left lumbar regions. Since that time the pains were constant, with occasional exacerbations; vomiting almost incessant; bowels somewhat constipated. Since the beginning of the attack absolutely no urine was voided voluntarily. On being catheterized on the second day about 30 c.c. of a purulent, non-urinous fluid were obtained; a second catheterization on the same day resulted in the withdrawal of about 4 c.c. of a similar fluid.[1]

Status præsens: Patient is markedly pale and anemic, and presents the picture of a person exceedingly ill. The expired air has a decidedly urinous odor, which is detected immediately on approaching the bedside of the patient. On examination it is found that the suprapubic region is tympanitic to percussion, without any physical signs referable to a distended bladder. The uterus is about the size of a large fist, and is in a position of normal anteflexion; to the right of the uterus there is to be palpated by bimanual examination a slightly tender mass about the size of a hen's egg. The left hypochondriac and left lumbar regions are occupied by a large globular mass, about the size of a child's head, which is so painful and tender as to render an exact palpation and its definition impossible. Some pain and tenderness also in the right kidney region, but not so marked as on the opposite side; this organ not palpable. Signs of dry pleurisy on both sides; aspiration of right thoracic cavity negative. Temperature 101.8° F.; pulse 120; respiration 40.

On being catheterized there were obtained about 40 c.c. of a milky fluid, which was alkaline in reaction, contained some albumin, a large amount of pus and some mucus; chemically just the barest indication of a trace of urea was found.

After a careful consideration of the past history and the presenting symptoms, the following diagnosis appeared to me to be justified: Acute suppression of urine, caused by a left-sided (most probably calculous) pyelonephritis, and reflex anuria of right kidney. Therapeutically I proposed a nephrotomy on the left side and a splitting of the capsule, and possibly also of the parenchyma of the right kidney, in order to relieve the congestion.

Operation at 1 A.M., March 6th. On account of the bad general condition of the patient, I hoped to be able to finish both operations with Schleich's infiltration anesthesia, but during the latter half I was compelled to administer chloroform. Through an incision about four inches long and parallel to the last rib, the left kidney was exposed. This was found to be very much enlarged and its pelvis tensely dilated. An incision through the parenchyma gave escape to approximately 1,000 c.c. of a purulent, straw-colored, urinous fluid; a finger introduced into the pelvis of the kidney could palpate no stone, nor did a metallic instrument elicit stone impact. The kidney was then drained by two large-sized drainage tubes, surrounded by iodoform gauze. The patient was then turned on the opposite side with the intention of exposing the right kidney and splitting its capsule, in order to relieve its presumed congestion so as to reestablish its excretory function. Contrary to expectations this part of the operation was exceedingly difficult, the kidney being apparently embedded in a densely adherent, very firm, cicatricial perirenal fat. Fluctuation, however, was apparent at a small point. and, pus being found on aspiration, the kidney was incised and drained, several drams of a thick, sanguinolent pus being evacuated. Duration of both operations one hour; duration of chloroform anesthesia, thirty-five minutes.

Patient was returned to bed in a fair condition.

March 6th. Patient passed a fairly quiet night. Toward morning bleeding from the uterus was noted, with signs of an incomplete abortion. This necessitated a curettage of the uterus, which was carried out by the house surgeon, Dr. Thorner. During this operation the patient was infused intravenously with 1,000 c.c. of saline solution in order to stimulate the kidneys; the pulse not making the infusion imperative remained good throughout.

The subsequent course was favorable; from the right wound soon only very little secretion drained; the left kidney apparently functionated perfectly, the bed of the patient, in spite of frequently changed bulky dressings, being always saturated with urine. In spite of this apparently satisfactory progress, the temperature three days after the operation again began to rise, most probably in consequence of retention in the right kidney. The rise was more marked in the evening, being followed by a remission in the morning.

It became evident that the patient could not progress favorably with the illy-drained pus cavity in the right kidney. This prompted me to a further operation March 18th, *i.e.*, barely twelve days after the first.

[1] For the principal and important parts of this past history I am indebted to Dr. Rosentoven, in whose care the patient was prior to her admission to the hospital.

March 18th. Nephrectomy. Laughing gas and ether anesthesia. The original incision on the right side was extended in both a downward and an upward direction. The fatty capsule was incised and the kidney enucleated. Although the kidney was very small its enucleation was exceedingly difficult on account of very firm and massive adhesions; rubber ligature tied around the pedicle and kidney removed. On examination the extirpated kidney was found to consist almost entirely of fatty and fibrous tissue. What appeared to be the ureter, leading from the pelvis of the kidney, was identified; but no blood-vessels of any size could be found. The subsequent microscopical examination by Dr. Mandlebaum showed only a few papillæ in the pelvis, with just enough tissue to be identified as kidney.

March 21st. Patient urinated voluntarily for the first time since the first operation, voiding 90 c.c., and a few hours later again 150 c.c. This urine was cloudy, of an acid reaction, sp. g. 1014, showed a trace of albumin, 1.6 per cent. urea; microscopically many pus cells, no casts.

Normal urination by way of the urethra, however, did not return for ten days more. After this date more and more urine was voided *per urethram* and correspondingly less through the nephrotomy wound. The final closure occurred April 21st, *i.e.*, forty-four days after the first operation.

The pedicle of the right kidney became detached April 7th. At no time were there any serious complications from this wound. Patient was discharged from the hospital May 8th, with a small sinus on the right side.

Proceeding now to an analysis of the various parts of this history, only this much may be accepted with an absolute certainty: It was a case of complete suppression of urine, of three days' standing; furthermore, as the operation and subsequent course have demonstrated, my preliminary diagnosis was erroneous. The question, therefore, arises, how can I justify this erroneous diagnosis, and what, if any, lessons may be drawn from this case, to obviate such errors in the future?

At the outset, it is needless again to call attention to the fact, that anuria as such is not a disease, but merely a symptom; and that when confronted with this symptom it is of paramount importance to recognize the underlying malady; as it is only by a prompt recognition of this malady that we can hope to cope successfully with this symptom; unless recognized and treated according to indications, a fatal issue must almost surely supervene.

As the functional disturbances, acute and chronic nephritis, which may in some severe cases be accompanied by a complete anuria, do not really come into consideration here, I shall pass over this subject with this brief mention.

For the sake of rapid elucidation of the subject, let me remark at the outset that in all cases in which the symptom of anuria supervenes, there must be some obstruction to the passage of urine. From the anatomy of the parts in question it is self-evident that this obstruction must be limited to that part of the urinary tract, the distal part of which may be stated as the mouth of the ureter, and the proximal part as the secreting parenchyma of the kidney. If the normal duplicity of these organs be taken into view, it is self-evident that a complete cessation of the urinary flow can be caused by only one of following conditions: (1) A simultaneous obstruction on both sides. (2) An obstruction in one kidney, the other being congenitally or operatively absent. (3) An obstruction in one kidney, the other being so far diseased that it does not secrete urine. (4) An obstruction or diseased condition of one kidney, the other being healthy; so-called cases of "reflex anuria."

Passing over now to a view of the various pathological processes which may come into consideration as etiological factors in the causation of anuria, we find the following:

(*a*) Calculi. (*b*) Organic strictures, bendings of the ureter, and malpositions of the kidney. (*c*) Compression of the ureters by extrinsic causes, for instance pelvic tumors and exudates. (*d*) Certain reflex influences which are caused by a diseased condition of one kidney, and which inhibit the secretory function of the opposite healthy kidney.

(*a*) *Calculi.*—The most frequent etiological factor is undoubtedly to be found in calculi. The size of the calculus varies very much with the locality where its progress between the kidney and the bladder becomes impeded.

(*b*) *Strictures, Bendings of the Ureter, and Malpositions of the Kidneys.*—Not an inconsiderable number of these pathological conditions, particularly those of a more severe grade, terminate primarily in a hydronephrosis, and this hydronephrosis may finally go on to such a degree as to cause an anuria. In view of the fact that malpositions of the kidney are practically always associated with the bending of the ureter, and, further, that in most cases, the primary termination of strictures is also in hydronephrosis, it will not be improper to consider all these conditions under one heading. It appears most probable, if not absolutely certain, that this method was at play in the causation of the case just reported.

In a normally-built urinary tract, the ureter is of just sufficient length to form the connecting link between the pelvis of the kidney and the bladder. As everybody, however, knows, it is by no means an infrequent occurrence, that the kidney becomes dislodged from its normal position in a downward direction; in other words, the kidney for the time being comes to lie nearer to the bladder. The ureter, however, being more or less firmly fixed behind the peritoneum, does not come under the influence of those forces which have pushed the kidney out of place. The physical result must be, that in a measure the ureter is longer than is necessary to make the connection between the pelvis of the kidney and the bladder. The natural outcome is, that there occurs a bend-

ing of the ureter at its junction with the pelvis of the kidney. In other words, the kidney may be said to rise and sink on a radius, the fixed central point of which is just at that portion of the urinary tract where the ureter merges into the pelvis of the kidney.

It is in this minor primary disturbance, of no consequence when compared with the final major lesion, that anuria not infrequently takes its origin. When traced from this point on to its ultimate termination, we will find the following intermediate developmental conditions.

Beginning with the slightest downward dislocation of the kidney, it is readily evident that the only movable portion of the ureter will attain a position which is more horizontal than normal; so that if the process continue the urinary current will finally be in an upward direction. If this be made clear, it is also readily understood, that there must be even at this time some obstruction to the outflow of urine; this in turn results in a beginning dilatation of the pelvis with some stasis of urine. As a rule at this stage there are as yet no symptoms of major consequence, provided that the kidney is freely movable between its normal position and the greatest distance of its excursion, because in the recumbent position (usually at night time), the dislocated kidney readily slips back to its physiological position, affording good drainage to the dilated pelvis. It may also happen in exceptional cases, that the kidney, although freely movable as a rule, does not return to its normal position. During the past summer I had occasion to treat an accident of this nature, which may not inappropriately be termed an acute hydronephrosis.

At about midnight of August 12, 1901, I was summoned to see Mrs. F. K., and obtained the following history. Patient is thirty-one years old, married and mother of three children. Has been complaining for the past five years of pain in the back and indefinite abdominal symptoms, and was variously treated, according to her statements, for "dyspepsia." About six hours before I saw the patient she was suddenly stricken with very severe pains in the right hypochondriac and lumbar region. She presented the typical picture of an attack of renal colic, and my first suspicion was therefore in this direction. On questioning the patient further I elicited the important admission, namely, that patient's urine during the day is as a rule unusually scanty, whereas at night (usually about three hours after going to bed) there occurs as a rule a voiding of a large amount of urine. On this night, in spite of repeated attempts, this did not take place, only about half a teacupful being voided.

On examination I found the right side of the abdomen a somewhat painful and tender mass, about the size of a double fist. This mass was freely movable and I had no difficulty in pushing it upward toward the diaphragm, whereupon the patient experienced almost immediate relief. Within an hour she voided 500 c.c. of a slightly turbid urine, and on my next examination the greatest bulk of the tumor had disappeared, while the remainder could without difficulty be recognized as a dislocated kidney, through the very lax and thin abdominal walls.

To obviate a repetition of this accident I advised nephropexy; but the patient feels so well with a properly padded abdominal bandage that she declines all operative interference for the present.

For a definite period, the duration of which depends upon the degree of mobility of the kidney, the human system accommodates itself to this periodical dilatation and evacuation of the pelvis of the kidney. In the course of events, however, this abuse of the kidney-pelvis leads to a loss of its natural contractility, as a result of which it does not empty itself completely, even when the kidney has been replaced to its normal position. The logical outcome is that there is *always* more or less stagnation of its urinary contents.

The next step in the development is that most probably on account of the gravity of the contents of the sac, the dilatation is not uniform in all directions, but that the most dependent calyces become more dilated than the upper ones. If such a kidney and its excretory duct be examined, the first impression is that the ureter has a faulty insertion, *i.e.*, into the upper part of the pelvis instead of the most inferior part. This faulty insertion, however, is not real, only apparent; what really did take place, is, that the more dilated inferior portion of the pelvis had been dragged away from the insertion of the ureter. Even at this stage of the process a *restitutio ad integrum* is still within the range of possibility; by replacing the kidney into its physiological position and retaining it there in a manner best suited for drainage, *i.e.*, with the ureteral insertion into the pelvis in the most dependent portion. If this be not done organic changes occur which are predestined from now on to frustrate our efforts in this direction.

While it is true that the surrounding structures accommodate themselves for a time to the presence of the more or less large foreign body, eventually, as a result of the compression of the renal vessels, and as a result of the constant irritation, adhesions are formed, not only between the kidney and the surrounding viscera, but also between the pelvis of the kidney and the ureter. In the beginning these adhesions are slight and easily torn by manipulation, but ultimately under the influence of continued irritation and congestion they become more and more firm. When this stage has been reached, they fix the ureter permanently into the pelvis of the kidney in an abnormal position, so that even were the kidney replaced into its normal physiological position, this procedure would be analogous to a reduction of a hernia *en bloc;* in other words, the reduction would have no effect upon the ureter, and the drainage of the hydronephrotic sac would remain still unimproved.

If the kidney and its excretory duct, the ureter,

be inspected at this stage, we would find the following anatomical relationship. The normally fixed portion of the ureter would in no manner be changed, except, perhaps, that it would be drawn somewhat more taut than is normal; at its most superior point there would be a downward bending, at a very acute angle, terminating in the very much dilated pelvis of the kidney. The contiguous surfaces of the kidney and the ureter will be found to be adherent to each other in such a manner, as to make it appear at first sight, that the ureter is inserted in the most favorable position for drainage, *i.e.*, at the most dependent point. If the parts, however, be carefully dissected, it will be found, that the true insertion is high up, at the acute angle before mentioned and entirely inadequate for proper drainage.

The pathological process may stop at this point, but more probably it will go on to further changes, under the influence of continued kidney secretion and continued obstruction to the outflow. Influenced by the two aforementioned physical forces, the pelvis becomes more and more dilated and organic changes take place at the bending of the ureter, with subsequent valve formation, blocking further the exit from the pelvis. The widely-dilated pelvis also effectually compresses the now doubly-fixed ureter, and when there is no more sufficient *vis a tergo* to overcome the barrier no urine will drain from this kidney into the bladder, giving rise to a typical picture of anuria on this side.

(*c*) *Anuria by Compression.*—Pelvic exudates and pelvic tumors, particularly those of a malignant nature, may reach such a size as to effectually compress the ureter against the passage of urine.

(*d*) *Reflex Anuria.*—In order to save repetition, this most important and interesting etiological factor will be considered under the heading of differential diagnosis.

The primary bilateral nephrotomies, and the subsequent secondary nephrectomy on the right side, have led me to believe that in the case of complete anuria just reported, I had to deal with a non-functionating right kidney and a functionating hydronephrotic left kidney, the latter being caused by a bending of the ureter, which in turn took its primary origin in a floating kidney. My belief in the correctness of this diagnosis has been strengthened by the careful observation of the post-operative course of events, and by the recovery of the patient. I arrive at this conclusion by the logical process of definite exclusion of all those other processes, which may be considered as possible etiological factors in the production of anuria.

To recapitulate, before operation we are compelled to consider the following possibilities in addition to the one just described: (1) Pelvic tumors and pelvic exudates; (2) organic strictures of the ureter; (3) calculi; (4) reflex anuria.

1. *Pelvic Tumors and Pelvic Exudates.*—Prior to the operation there was certainly good ground for considering this possibility, and it received its due share of estimate. Vaginal examination revealed to the right of the uterus an indefinite mass, which, when taken in connection with the absence of the menses for two periods, might have been mistaken for an extra-uterine pregnancy, ruptured or unruptured; which might possibly have involved and compressed the mouth of the ureter. There were, however, no symptoms pointing to a ruptured extra-uterine pregnancy, while the mass itself was too freely movable to have been enabled to induce so marked a compression of the ureter as to cause an anuria. After the operation it was seen that this possibility could not have come into play, as the mass was situated on the right side, while the only functionating kidney was situated on the opposite side.

2. *Organic strictures, particularly obliterating strictures of the ureter,* while considered, were excluded before the operation by the absence of any history of ureteritis, the sudden onset, and the anamnesis. After operation they may be excluded by the fact that the nephrotomy wound healed completely, without any subsequent operative interference upon the ureter.

3. *Calculi in the Pelvis of the Kidney or Ureter.*—Figuring probabilities, one must naturally come to the conclusion that it is and must be an occurrence of the greatest rarity indeed that there should occur a simultaneous plugging up of both ureters or pelves by calculi. While of course this is not an impossibility, I am sure I will meet no opposition, when I say, that the extraordinary rarity of this occurrence should almost practically exclude it from lengthy consideration. The subject of calculi in the urinary tract can not, however, be dismissed with this knowledge of improbability, as it has a further and more important bearing in the etiology and pathology of anuria. Actual experience has shown that anuria may also be caused by a calculus plugging up one ureter or one kidney only, in spite of the fact that the other kidney is normal in all respects. This brings us to the consideration of those cases of anuria which have been termed "reflex anuria." Before entering upon this subject at greater length, it is but right to state that this condition may be brought about by other conditions as well, but as it is most frequently caused by concrements, it is perhaps best to illustrate it on this basis.

4. *Reflex Anuria.*—When confronted with a case of anuria, it is but natural at first sight to think of some mechanical obstruction to the flow of urine; clinical experience, however, has shown that in addition there occur a number of cases in which this mechanical obstruction does not exist, and that the true trouble is to be sought in the secreting parenchyma of the kidney. The occurrence of these cases is amply proven not only by clinical experience but also by animal experiment. Experimentally, by increasing the

intrapelvic pressure of one kidney it is possible to effect an inhibitory influence upon the secretion of the opposite kidney.[1]

As previously stated, not only has this theory been proven experimentally, but there are on record also a number of well observed cases, which prove without any doubt also their clinical occurrence.

Without going needlessly into a detailed description of the pathological condition, I shall be permitted to illustrate it by a picture, as it not infrequently occurs. The process presumably begins with two kidneys, one of which is perfectly healthy, while the other forms the habitat of a round calculus, the diameter of which is presumably just a trifle larger than the diameter of the ureter. For some reason or other this calculus begins its downward migration and becomes engaged in the ureter; but being too large for passage, it effectually closes up this ureter. For a while this kidney continues to secrete urine, which is naturally bound to increase the intrapelvic pressure; and this increased intrapelvic pressure acts reflexly upon the opposite healthy kidney in such a manner, as to innibit and finally totally suppress its secretion.

Let us now see what value and reliance are to be placed on the knowledge of these facts when a case presents the physical symptoms enumerated in my case. There are several points which, as in all cases of difficult diagnosis, aid us in arriving at a conclusion. These points are the anamnesis and physical examination. Leaving entirely out of consideration the fact, that a fair order of intelligence is required on the part of the patient to obtain an anamnesis of value, it is precisely in cases of anuria that we have to take into account the additional obstacle, that not infrequently, on account of the severity and nature of the ailment, the condition of the patient is such, that not much reliance is to be placed upon the answers obtained. In the case reported, the most important points obtainable were as follows: (1) A history of malaria (?); (2) increased frequency of micturition; (3) sudden onset of the present illness, with very severe pain in the left hypochondriac and left lumbar regions; (4) no history whatsoever pointing to involvement of the right side.

The physical examination, excluding those signs which had no bearing in the case, revealed (*a*) a very large, painful, and tender mass on the left side in the region of the kidney; (*b*) very slight tenderness in the corresponding region of the right side.

If we wish to interpret, before operating, the various parts of the past history, and the presenting physical signs, it is the writer's opinion that the following conclusions were justifiable:

(1) All those parts of the history which the patient collects under the term of "repeated attacks of malaria" may have been caused by a suppurative process of the left kidney, possibly a calculous pyelonephritis.

(2) The sudden onset of the present illness, with sudden, sharp and severe pain in the left hypochondriac and left lumbar region may be interpreted as an obstruction of the ureter by a preexisting calculus.

(3) The physical examination revealing a large, painful and tender mass occupying the region of the left kidney, and approximately normal conditions on the right side, should be interpreted as most probably a calculous hydronephrosis or pyonephrosis, which by increasing the intrapelvic tension has most probably caused reflexly an inhibition of the secretory function of the right kidney.

During the operation, however, the faultiness of this diagnosis soon became manifest. As careful and as lengthy a search, as the condition of the patient admitted, failed to reveal the presence of a calculus in the left kidney; while the right kidney, as already stated, was represented merely by a mass of cicatricial tissue, containing in its center a small amount of pus. Of course it may be argued that the left-sided hydronephrosis may have been caused by an impacted calculus in the unexplored portion of the ureter; this theory, however, is in the writer's opinion thoroughly refuted by the following points:

Such an impacted calculus may terminate in one of following methods: (*a*) It remains impacted in the ureter; then the nephrotomy wound would refuse to heal; (*b*) it may be passed into the bladder; then either it undoubtedly would have been discovered, or it would have been passed *per urethram;* (*c*) it may have been extruded through the nephrotomy wound; then, with the care devoted to the patient, it would also have been discovered.

After considering the various possibilities in this manner, and excluding those which have been proven to be manifestly wrong, either by the operation, or by the post-operative course, we can come only to the following conclusion, which, no matter how critically viewed, will be found to stand the test in all particulars: Anuria in a patient with an absolutely non-functionating right kidney,* the left kidney being hydronephrotically dilated, due to a downward displacement of the kidney, resulting in such bending of the ureter, as to completely interfere with the passage of urine.

Treatment.—If the literature upon this subject be carefully reviewed, it must be conceded that occasionally cases occur in which recovery takes place without any interference, even if several days have elapsed since the onset of the anuria. These fortunate terminations, however, are so rare that it would be manifestly wrong to permit the condition to go on for any length of time, without any attempts at relieving it.

[1] Chirurgische Klinik der Nierenkrankheiten. Prof. Dr. James Israel, Berlin, 1901.

* The small amount (4 c.c.) of fluid found in the bladder was undoubtedly merely a downward leakage from the pus-sac in the right kidney; as already stated, it contained merely the faintest indication of a trace of urea.

If the nature and pathological anatomy of anuria be understood, it does not require much argument to show that the only interference can be a surgical one. It is also readily conceded that the principal indication which the treatment must bear in view is the excretion of urine, in order to rid the system of the various deleterious substances which are separated through the medium of the urine. The attainment of this object is of paramount importance; all other points are secondary and must give way to this primary indication. In other words, the excretory function of the kidney is the important one; the passage of urine into the bladder is secondary. To attain this point, there can be but one answer, and that is *nephrotomy*.

Nephrotomy having been decided upon, the question naturally arises as to which kidney is to be attacked; it would be manifestly wrong to incise that kidney which has even some time prior to the onset of the anuria done no work and which is so far diseased that no work is to be expected from it. In order to be able satisfactorily to decide this point, it is of the utmost importance to make as exact a diagnosis and differentiation of the underlying pathological condition, as the circumstances will permit.

The immediate indication having been met by nephrotomy, if the patient's condition will allow, further steps may be taken at the time of the operation toward relieving some of the mechanical obstructions which may be met with. As drainage and relief of the congestion of the kidney parenchyma are the major indications, it is self-evident that suture of the incised kidney is absolutely contraindicated.

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DEXTROCARDIA DUE TO PULMONARY CIRRHOSIS. WITH PRESENTATION OF CASE.[1]

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THERE are but few text-books in which dextrocardia, or displacement of the heart to the right side, is given any consideration, though cases of this nature are by no means uncommon. A more or less thorough description of this condition is given by Osler in a special essay[1] and also mentioned by him in another book,[2] devoting a few lines to this subject and dismissing it by saying that "it is one of purely anatomical interest."

Because it bears a direct relation to pulmonary diseases, we deem this phenomenon of considerable importance; it is more than an anatomical curiosity, especially for those who are interested in phthisiology as such; and, therefore, having a case of this nature to present, it is not amiss to offer a condensed review of the subject, as the literature of it is quite meager.

We call the position of the heart in the right side abnormal, because normally we look to the apex beat in the fifth intercostal space slightly to the right of the left mammary line. This malposition is due either to congenital causes or to pathological changes in adjacent organs. In congenital malpositions the heart may be placed vertically in the chest, the apex beat noticeable at the lower end of the sternum. Sometimes the organ is situated transversely. *Ectopia cardis* is a very serious congenital malposition, which is due to failure of closure of sternum; there are also cases in which the heart lies outside of the chest wall.

There are malpositions consequent upon the disease of the heart itself or its membranes: in pericardial effusions the apex is slightly raised and the heart itself is pushed backward. In dilatation and hypertrophy the heart occupies a large area of the chest, and the apex can be found in the left axillary line in the seventh or eighth intercostal space,

To quote Osler: "To understand clearly the effects upon the position of the heart in disease in contiguous organs we must bear in mind their mutual relations. Situated in the mediastinum between the lungs on either side it is subject to the elastic traction of these organs, which counterbalance each other; but if from any cause the elastic tension of one lung is suppressed, as in pneumothorax or in pleural effusions, then the other lung may also collapse to a slight degree and pull over the mediastinum and with it the heart."

With this comprehensive quotation in mind, we are in better position to touch on malpositions due to changes in contiguous organs, and the following may be briefly considered.

Changes in the Chest Wall.—In some cases of rickets there is an incurvation of the ribs and costal cartilages with consequent alteration of the position of the heart. In curvature of the spine there may be considerable malposition of the heart as well as of the great blood-vessels.

When we come to consider the affections of the lungs and the enveloping membrane we shall find that in emphysema pulmonalis the heart may be displaced or rather pushed downward, and the apex beat seen more to the right because of the pressure exerted upon the diaphragm. As we mentioned before, in pleuritic effusions the displacement of the heart to the sound side is almost of constant occurrence if the exudation is of any considerable amount. After the exudation is absorbed or the sac emptied by operative procedures, provided no strong adhesions were formed, the heart returns to its previous normal position. In this connection I may mention two cases of empyema in children who were under my care and close observation, because of the dislocation of the heart.

One child, two years and a half old, an exceptionally large child, weighing more than forty pounds and looking as one of at least four years old, developed lobar pneumonia. This case terminated apparently well by crisis on the ninth day, yet in the third week it developed empyema on

[1] Read, and case presented, before the Sullivan County Medical Association, April 9, 1902.

the same left side. Having been called to see the child again, and looking for the cause of the unexpected trouble, I was struck to find the apex beat on the right side of the sternum, which condition, I was sure, did not exist when I treated the boy when he was suffering from pneumonia, as I examined the heart repeatedly. This abnormal position of the heart gave me a hint of an extensive empyema on the left side, and on introducing an aspirating needle I withdrew a syringeful of pus. I operated on the child the same day. It being a recent case I made an incision only, under ether anesthesia, large enough to introduce two fingers, and about a quart of pus escaped. Soon after the operation the heart was noticed to recede to the left side, and after three weeks, when the last dressing was removed, I found the heart and apex beat in the normal position.

In my second case, empyema on the right side, a resection of two ribs was indicated, as the case was a neglected one; the heart was pushed to the extreme left, and after six weeks' drainage and irrigations the heart gradually returned to its normal position.

To go over to the particular subject to which I wish to engage your attention, namely, the displacement of the heart to the right side of the chest because of sclerotic changes in the lung substance: generally this dislocation is associated with displacements of other organs, the liver to the left, the spleen to the right. In the present case no displacements of other organs are found. In such malpositions the area of cardiac dulness in the usual position is wanting, and on careful percussion it will be detected across and to the right of the sternum, as in our case. I mentioned careful percussion, because, as in the case presented, the right lung being consolidated or rather indurated, one must carefully differentiate between the normal *cardiac* flatness and abnormal pulmonary dulness due to consolidation. Our case seems to be of particular interest, inasmuch as the right heart rests on a cavity, just as a formidable rock leans on the bank of a precipice ready to plunge in and be absorbed, or to fill up the gaping abyss. The case before you is one of cirrhosis of the right lung, due to fibrous phthisis, as Austin Flint would call it; there is a cavity of considerable size in the middle lobe anteriorly. The heart is drawn to the right side, showing the apex beat in the fourth intercostal space about half an inch to the right of the sternum. The cardiac action, as is usually the case, is not in any way affected. The pulse is normal, eighty beats per minute; there is no suffering from cardiac dyspnea.

The history of the case, as taken from my case-book, dated January 3, 1902, is as follows: Mr. P., twenty-six years old, single, store clerk, Austrian, came over when ten years old; family history negative. Five years ago he "caught a cold" while doing some hard work out-of-doors; he coughed a good deal, went for a short time to the country, got better, returned to previous occupation (long hours, badly-ventilated apartments, no sunlight, store being located in a basement); "caught cold again," since which time he was always coughing and with much expectoration. Had one slight attack of hemoptysis. Had night-sweats and hectic fever. Returned from Colorado about three months ago. Appetite poor, looks pale, bowels constipated, emaciation considerable. Lost fifteen pounds during a short illness; his weight, 110 pounds. Examination of his lungs as just mentioned; sputum examination revealed numerous tubercle bacilli in colonies and rods. Since then he has gained considerably in weight, to 115 pounds; appetite improved, bowels more or less regular, and the general condition brighter. The sputum examination March 2d shows a number of tubercle bacilli, but not so many, and no colonies.

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THE MODERN TREATMENT OF PTERYGIUM.

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NOWHERE, perhaps, does time count for so much as in minor surgery and above all in the minor surgery of the eye. A patient expects and is, perchance, willing to give up his business or occupation for a serious injury and he realizes that this must be done for a major operation; but small matters, particularly when they are not accompanied by much pain or inconvenience, are generally postponed until they have become serious enough to demand relief and even then the invariable question is, "How long will it take, and for what length of time shall I be forced to give up my work?" This is particularly true of pterygium; as a rule, it does not occur in women, in whom the disfigurement would lead to early treatment; nor does it generally produce much discomfort until it has encroached upon the cornea, with a resultant loss of vision, so that these cases do not often find their way to a surgeon until the disease is far advanced, and the treatment under the old methods offers quite a problem; for it must be remembered that the apex of the pterygium is not the boundary of the disturbance in the corneal elements, but that there is a patch of haziness beyond it and that even when this is not apparent by examination, the structure of the cornea is apt to lose its homogeneousness, and may thus produce irregular refraction, as was demonstrated by the ophthalmometer by Noyes. This accounts for those cases of impaired vision in which the growth has not yet encroached upon the pupillary area, and goes to show that it is not always safe to postpone operative interference, because there is a band of seemingly clear tissue between the growth and the margin of the pupil. As a rule, however, the patient *has* postponed it, and we are confronted with an affected cornea and a mass of hypertrophied conjunctival and subconjunctival tissue, the removal of which will leave a

dense opacity of the cornea and a thick and tendinous cicatrix at its base, particularly when this is large and vascular.

To meet this condition many operations and modifications of them have been in vogue, but they may be all classed under three heads:

1. *Excision,* which consisted of dissecting the apex from the cornea with a pair of curved scissors or a cataract knife, and then, having freed the edges of the conjunctival portion, of excising it at about a line or a line and a half from the limbus, the conjunctiva being then brought together by sutures. This was the usual operation as advocated by Arlt and modified by Pagenstecher, who simply turned the excised portion back, and having brought the edges of the cut conjunctiva together with sutures, allowed the separated part to shrink and gradually disappear.

2. *Transplantation,* which differed from the operation just described simply in the fact that the freed corneal portion, instead of being excised, was inserted in a wound in the conjunctiva below the cornea, where it could not encroach on it. This was particularly applicable in those cases in which the pterygium was very large, and was first introduced by Desmarres, who detached the growth quite up to its base; he then made an incision in the conjunctiva, parallel to the lower edge of the cornea and retained it there by sutures. This was improved on by Knapp, who divided the body of the growth after the excision of the corneal portion by a horizontal incision, covering the wounds by square flaps of conjunctiva from the tissues above and below.

3. *Ligature,* which consists of strangulation by sutures. This was introduced by Szokalski, who allowed the ligatures to remain in place for five days, and then cut out the atrophied portion. He claimed that the cure was permanent, and that in no case had the difficulty recurred; but the published reports from the operation have been meager, as the procedure does not seem to have been a popular one, probably from the length of time necessitated by the treatment.

In regard to the first two methods, the objections are bifold: In the first place, the stripping of the growth from the cornea, no matter how skilfully it is done, leaves a denuded spot, which extends during the process of repair beyond the original wound and is seldom, if ever, completely absorbed. It must be remembered that the disease itself is almost always one of adult life and occurs in tissues that are already weakened and relaxed. In the second place, the bulk of the remaining conjunctival mass presents not only a most disfiguring appearance, but from its shrinking into tendinous bands often leads to a feeling of traction that impedes the motion of the eye and gives rise to a general sense of discomfort; and in those cases in which the base was broad and the consequent loss of substance large, the cicatrix is at times dense and prominent, producing what is called "secondary pterygium," which, according to Wells, sometimes requires a subsequent operation.

Added to these drawbacks, which relate more to the operator than to the patient, we still have the interest of the latter to consider, for on him falls the brunt of the trouble—the loss of time, the interference with business and the suffering and expense of a tedious convalescence; and as these cases usually occur in persons of the middle classes who are subjected to exposure and the vicissitudes of an outdoor life, it is often impossible for them to submit to any treatment that interferes with their occupation.

A little over a year ago, Dr. A. Coe, of Washington, read a paper on a new operation for pterygium and presented a case before the Washington Ophthalmalogical Society. This method consisted in the direct application of the cautery to the apex of the pterygium on the cornea, leaving the rest of the body to take care of itself. The case presented had been operated on some months before and the cautery had been applied three times at intervals of a few days, the first application being made to the center of the apex and the two subsequent ones laterally. The instrument used was a platinum wire with a bulbous head of about the size of a small pea, and the results of this, the initial case, were most satisfactory. There was still a white opacity—where the apex had rested on the cornea, but the tissues up to that point were clear and transparent, and the opacity itself was evidently much thinner than it had been and there was a great reduction in the size and vascularity of the pterygium. Since then I have used this method in twenty-three cases, and with complete success except in one case, which was very large and vascular, with a central vessel of considerable size that I ligated, the only case in my experience in which the cautery, alone and unaided, has not proved sufficient. The operation is simplicity itself; all that is required is an alcohol lamp and a platinum wire; the latter I have changed from a bulbous point to a hook of about three and a half millimeters in width, and one in thickness mounted on a wooden handle. After the eye is thoroughly under the influence of cocaine, I press the bottom of the convexity heated to a white heat against the point at which the apex protrudes above the surface of the cornea, on the pupillary side, and then, elevating the handle, bring the rest of the platinum to bear in a direction parallel to the axis of the pterygium from the apex toward the base. One application of the cautery, if thoroughly done, is generally sufficient, and my habit has been, when it has been possible, to put the eye through a preliminary course of treatment with Pagenstecher's ointment of the yellow oxide of mercury to reduce the vascularity and to decrease the size of the growth as far as possible before operating. This is again continued a few days after the throwing off of the eschar, vaseline being substituted for the hydrated glycerole of starch as a menstruum, as it produces less pain and subsequent inflammation.

As to the etiology of the disease, it is hardly a point that enters into a description of an opera-

tion; yet I cannot help expressing the opinion, while the text-books all agree that it is due to exposure, to a seafaring life, to the effects of dust, glare, and external irritation, that at least heredity does exert an influence on its production. Of the twenty-three cases treated by me several were brothers, one of whom only had been exposed to the conditions supposed to be favorable to its production. One man stated to me that his father had had it in both eyes, and on his second visit brought his son, a strumous lad of fourteen, who had passed his life in a child's hospital, entirely removed from any source of ocular irritation whatever. Not only was this the youngest case that I have heard of, but it was the only one that I have ever seen that was vertical, the base being immediately above the insertion of the superior rectus. His father stated that it had existed for some time, and there was no history of any preliminary attack of phyctenular conjunctivitis or pinguecula. Of course it is impossible to form statistics from such a limited number of cases as twenty-three; but, small as the number is, it is large enough, I think, to have demonstrated the fact that there is no pain at the time of the application of the cautery, nor after it; that it is not followed by inflammatory reaction, that there are no sutures to be removed, nor wounds of a protracted nature to be healed; that the patient loses little or no time from his vocation; and, in short, that the operation has been removed from the domain of major surgery to one of the most minor operations of the eye.

REPORT OF A CASE OF GRAVE ANEMIA.[1]

BY J. S. TRIPLETT, M.D.,
OF HARRISONVILLE, MO.

THE report of a case in practice is submitted for your consideration, first, because I believe the report will bring out practical and interesting points; second, because the diagnosis had to be arrived at mainly through laboratory investigation; third, because the most important pathologic findings in this particular case constitute a comparatively new field in the causation of disease, *viz.*, hematology; fourth, because I hope to be able to demonstrate the lesion under the microscope; fifth, because cases of this nature are not frequently encountered.

On July 13, 1901, Mrs. X., white, married, age fifty-one, no children, occupation housewife at farm, consulted me at my office for diagnosis of her condition. The exertion required in mounting the stairs exhausted her to such a degree that she was unable to engage in conversation for ten or fifteen minutes. She gave the following history:

Family history entirely negative. Previous to about two years ago her health had been exceptionally good; her usual weight ranging about 140 pounds. Her present illness then began, although she can fix no definite date from which to reckon her feeling of languor, which eventually became extreme; still she kept on with the performance of her duties, which consisted of light housework, that of a seamstress, and occasionally that of a nurse, thinking that she would finally overcome her malady without the aid of a physician. During the greater part of this time she lived alone. About one year ago she was married, since which time she has lived on a farm, performing such duties as pertain thereto. Her married life was entirely satisfactory and happy. Her health still continued to grow worse, strength and energy gradually declined, weight decreased, and anorexia became more pronounced. With the oncome of the excessive heat of June and July she failed more rapidly, ate very little, complained of nausea and pain in stomach, drank very little water and slept badly; complained of a throbbing sensation in left chest at lower costal margin, faintness and a tingling sensation in lower limbs below knees; also noticed some swelling at ankles.

It was in this condition, after much persuasion on the part of her husband, that she consented to consult a physician. As stated above, the exertion of mounting the stairs produced such breathlessness and faintness that she was unable to converse for several minutes. Her countenance was pale, as was also the mucous membrane of the lips and gums and tongue. Pulse 100; temperature 99.6° F. Slight hemic murmur at inner side of apex.

The subjective symptoms complained of were loss of appetite, occasional nausea and pain in stomach, very decided indisposition to exertion, and inability to endure any kind of exercise without faintness, breathlessness and palpitation following. Special senses showed no departure from the normal.

Blood examination showed malarial infection and poikilocytosis, with .45 per cent. hemoglobin by Hammerschlag.

June 19th, patient again reported in town, but could not climb the stairs to reach my office. Her condition had not improved.

July 25th, I saw her at her home in the country, where I have subsequently seen her at intervals of two or three days. Her condition has now compelled her to keep her bed. She suffered no pain, but became in turn melancholy and hysterical, which condition continued for about two weeks, then subsided not to reappear, and her mental faculties have remained unimpaired throughout her illness.

As time progressed symptoms were intensified and new ones appeared. Faintness and palpitation became so marked that she would lose consciousness on being raised from the horizontal position. The skin presented a blanched and waxy appearance, the tongue seemed bloodless, the muscles became flabby, rather than wasted, edema at ankles increased, and slight puffing below the eyes was noticed. The tactile, pain, pressure and thermic senses were progressively obtunded and finally lost from the feet to the hips; muscular action was also lost in same man-

[1] Read before the Hodgen Medical Society, Harrisonville, Missouri, October 3, 1901.

ner. A bed-sore made its appearance over the base of the sacrum with no tendency to heal, and later one developed on the outer aspect of the right thigh two or three inches below the trochanter major.

Following shortly after the paresis of lower extremities, the rectum and bladder became involved; hardened feces accumulated in rectum, and nurse had to remove same with fingers; flatus and liquid feces passed involuntarily and without patient's knowledge; bladder became distended and a large quantity of urine was withdrawn; bladder was thereafter regularly catheterized every six hours.

On September 20th, the progressive march of the disease seemed to come to a standstill, and the patient's condition remained as just described.

The temperature throughout her illness has ranged from 98 to 102° F., without regard to rhythmic periodicity of days or hours, nor was it influenced by medication. The pulse was rather thin and feeble, from 76 to 100 per minute, showing most variation after or during exertion or exercise (passive, as alcohol rubs, cold rubs and massage).

September 24th, urinalysis showed reaction acid; specific gravity, 1010; phosphates, 5 per cent. (normal 8—10 per cent.); chlorides, 6 per cent. (normal 8—10 per cent.); chlorides, 6 per cent. (normal 10—12 per cent.); urea, 0.019 (normal, 0.02—0.03); nucleo-abumin present; mucous corpuscles present; pavement epithelium present; bacteria present; diazo-reaction, negative; bile, none.

Several blood examinations were made and much interest attached to the findings in these examinations, because here I was able to demonstrate the effect of the cause, if indeed not the cause, of the grave anemia and oligocythemia.

From the beginning of my observation of the case to September 20th, there was a progressive decrease in the percentage of hemoglobin, reaching at one time even as low as 30 per cent. by Hammerschlag, and each examination showed malarial infection.

Poikilocytosis, *i.e.*, red cells of irregular size, shape and form, was observed in all slides examined.

The following cells, pathognomonic for certain anemias, are well shown in some of the slides, which I have prepared for inspection: (1) Normoblasts, small nucleated red cells. (2) Megaloblasts, cells which are two to four times larger than normal red cells, and provided with a large nucleus. (3) Small mononuclear leucocytes or lymphocytes are observed in increased numbers. (4) Polynuclear leucocytes are observed in diminished numbers. Red blood corpuscles October 2d showed 1,144,800 per cubic millimeter.

I believe the anemia in this case has been caused by chronic malarial cachexia. I will say that patient does not cough or expectorate, and that several examinations have failed to show any evidence of malignancy.

The patient died November 2d.

MEDICAL PROGRESS.

PHYSIOLOGY.

Exclusive Meat Diet and Certain Modifications of Nutrition.—As the result of experiments on dogs fed exclusively with meat, E. DUFOURT (Jour. de Physiol. et de Pathol-Gen., May 15, 1902) found in 75 per cent. of the cases albumin and normal bile pigments in the urine. There was a great increase in the quantity of indican, as well as in the nitrogenous extractives. There occurred marked emaciation, together with trophic disorders of the skin. Exclusive and excessive meat alimentation rapidly produces congestion of the kidneys and liver, and causes a considerable increase in the toxic by-products of nutrition.

Action of Raisin-juice on the Organism.—Of eminent value in practical therapeutics are the conclusions arrived at experimentally by H. MOREIGNE (Arch. de Méd. Epér. et d'Anatomie Pathol., May, 1902). The administration of raisin-juice causes increased diuresis, diminished acidity of the urine, diminution in the relative and absolute quantity of uric acid; a derivative action on the intestine, which gives it value as a laxative, and a diminution of intestinal fermentation; its metabolism tends to spare the nitrogenous elements of the tissue; it causes a disposition of fat in the organism; it stimulates the hepatic mechanism, particularly the secretion of bile. The particular virtue possessed by raisin-juice in saving the nitrogenous tissues and leading to a formation of fat makes it of singular value in the treatment of diseases accompanied by a rapid wasting, for example, tuberculosis.

Local Reactions of the Arterial Wall to Internal Pressure.—Like smooth muscle in other situations, the muscular coat of the arteries reacts, according to W. M. BAYLISS (Jour of Physiol., May 28, 1902), to a stretching force by contraction. This is similar to the increased force of the heart-beat produced by augmented intraventricular pressure, and the contraction of the body walls of the earthworm in response to a pull. The author observed this phenomenon of reflex activity of the arterial wall in the course of experiments on vasodilator nerves. On stimulating the central end of the depressor nerve of the rabbit, there is a passive diminution in the volume of the hind limb, which is caused by fall of blood pressure. As soon as the excitation ceases and the previous height of blood pressure is attained, there is a considerable expansion of the limb lasting for some time. This expansion is due to the relaxation of the muscular wall of the arteries, which soon responds to the rise of pressure by returning to its original state of tone. The arterial wall also reacts to a diminution of tension by relaxation. These reactions are independent of the central nervous system, and are of a myogenic nature. They also occur in excised arteries, which proves that the phenomena in question are due to no other cause than the change of tension, and also proves their myogenic nature. The practical value to the organism of these reactive powers of the arteries is as follows: They provide for a constant flow of blood to the tissues supplied by them, whatever may be the height of the general blood-pressure, except in so far as they are directly overruled by impulses from the central nervous system.

The Formation of Lymph by the Liver.—A valuable contribution to the interesting question of the mode of formation of lymph in the body is furnished by F. A. BAINBRIDGE (Jour. of Physiology, May 28, 1902). The view has been promulgated by Asher and Barbera that the formation of lymph is to be attributed to an increased activity of the tissues and that changes in blood-pressure have nothing to do with it. These

investigators increased the activity of various organs, including the liver, by means of intravenous injections of ox-bile, ammonium salts and sugar, which substances led to an increased flow of lymph from the thoracic duct. They assumed that this indicated an augmented metabolism of the liver. Instead of bile, Bainbridge injected a definite quantity of sodium taurocholate into the femoral vein and thereby caused an increased flow of lymph from the thoracic duct. This lymph was tinged with hemoglobin. After ligation of the liver lymphatics in the portal fissure, the injection of sodium taurocholate caused no augmentation in the flow of lymph. He therefore concludes that the latter is derived from the liver. Starkling disclosed that there are more solids in liver lymph than in mixed lymph, and that the former clots more readily. In connection with these facts it must be noted that the intravenous injection of bile-salts causes an increased flow of bile, as well as an increased flow of lymph. It was found that the rate and flow of these two substances are similar, although the former reaches its maximum earlier than the latter. Large doses of sodium taurocholate have no influence on the vena cava blood-pressure, while peptone markedly raises the latter. It is evident that sodium taurocholate is not a lymphagogue of the peptone class, nor does it belong to the sugar class, for the latter causes blood-pressure changes of the nature of hyperemic plethora. The increased flow of bile represents an augmented metabolism of the liver cells. According to Shiff, bile-salts are absorbed from the intestine, enter the blood-stream, are taken up by the liver cells and are secreted in the bile. The intravenous injection of bile-salts is therefore nothing more than an exaggeration of the normal physiological process. The bile-salts destroy the red-blood cells and set free nucleo-proteid, which is known to increase the flow of lymph. To eliminate the possibility that the augmented flow of lymph in these experiments is not caused by nucleo-proteid, Bainbridge injected the bile-salts into the splenic vein, so that they could not enter the general circulation. The formation of nucleo-proteid was so small that it could be disregarded. How does the liver cause the flow of lymph? As the result of the activity of the liver, metabolites (products of metabolism) are set free; these have a comparatively small molecular weight, and many of them are of a crystalline nature. They leave the tissues and finally reach the blood-stream, either for immediate excretion by the kidney, or for further metabolism elsewhere. The bile-salts in the circulation stimulate the liver to increased activity. The metabolites reach the lymph spaces surrounding the hepatic cells, where they raise the osmotic pressure of the lymph. As a result water passes by osmosis from the blood to the lymph. The latter loses its excess of concentration and at the same time a flow of lymph is produced. An alternative theory is that the bile-salts exert a specific action on the liver capillaries, causing them to secrete a larger quantity of lymph.

Fatigue in Non-medullated Nerves.—In line with the results obtained by other investigators, that medullated nerve fibers do not show functional fatigue, T. G. BRODIE and W. D. HALLIBURTON (Jour. of Physiol., May 28, 1902) prove that the same is true for non-medullated nerve fibers. Waller had shown that during nerve activity there is an increase in the action current similar to that produced by small doses of carbolic acid, and he inferred that it is this substance which is produced during the passage of the nerve impulse, as a result of the destructive metabolism of the constituents of the fatty sheath. According to this investigator, the active gray axis both lays down and uses up its own fatty sheath; the nutritive process so quickly follows the destructive that it is impossible to demonstrate the evidences of fatigue. Brodie and Halliburton assumed that if this be the case, then it would be possible to discover the phenomenon of fatigue in non-medullated fibers. The non-medullated fibers of the spleen were experimented upon. When these are stimulated with an electric current there results a contraction of the spleen, the volume of which is measured by means of an oncometer. Interposed between the electrodes and the spleen and with the nerve resting upon it, was a tube through which was flowing cold water, slightly above the freezing point. The cold acts as a block, preventing nerve impulses from reaching the spleen. The nerve was then stimulated for many hours, at the end of which time the block was removed. Stimulation of the nerve now evoked a contraction of the spleen which was equally as vigorous as before the persistent stimulation. This proved that the non-medullated nerve fibers of the spleen show no demonstrable evidence of fatigue. Howell and others had referred to the phenomenon of "stimulation fatigue," namely, that certain nerve fibers, mainly of the non-medullated variety, are injuriously affected by prolonged faradization, and are not again excitable until after a period of prolonged rest. According to Brodie and Halliburton, this is not truly fatigue, but the result of polarization of the nerve. The peripheral fatigue of the nerve-terminals in the spleen, which is readily induced, does not vitiate the results of their experiments. Stimulative fatigue is produced in the case of vasomotor nerves, but not in the case of the nerves of the spleen. Stimulation fatigue, moreover, does not bar the transmission of nerve impulses.

Intestinal Absorption of Solutions.—Recent investigations have shown, according to WAYMOUTH REID (Jour. of Physiology, May 28, 1902), that the normally preserved intestinal mucosa is not to be classed as a passive diaphragm between blood on the one side and solution in the gut on the other. The fact that the solutions on the two sides of the membrane are of different constitution gives rise to the following question: To what extent is the end result due to the specific physiological action of the membrane, and to what extent to the difference in composition of the fluids on the two sides? As regards the absorption of water, it is found that the cells of the intestinal mucous membrane are capable of sucking up fluid and passing it to the blood. The cell mechanism can deal with considerable variation of the osmotic pressure of the solution presented to it, but, as the pressure increases, a limit is reached beyond which it is affected and absorption of water is consequently retarded. As regards the absorption of substances in solution, the question revolves upon whether the partial osmotic pressure of the substance in solution in relation to that of the same substance in the circulating blood is the sole determining factor or not. That it is not the sole factor is shown by experiments in which sodic chloride solution in the gut, having the same concentration as the blood with respect to sodic chloride, presents the phenomenon of the absorption of water and salt at the same rate. Since osmosis can play no part in the absorption of salt, this substance must be in some occult way carried into the blood by the cell mechanism. Loeb has shown that salts have specific physiological effects besides those due to the pressure exerted by them in the state of solution. Both 4-per-cent. solution of glucose in water and 2-per-cent. solution of glucose in 6-per-cent. NaCl solution are fluids from which glucose and water are taken up at the same rate. The effect of salting the solution of glucose is that the uptake of glucose is favored at the same time that that of the water is retarded by the salting. The author concludes that from a study of the

absorption of weak solutions of glucose it appears that, with the intestinal membrane as normal as experimentation will permit, phenomena present themselves which are as distinctly opposed to a simple physical explanation as are those previously studied in the absorption of serum. Probably with weak solutions of non-irritating substances, the specific cell-action is the main factor, variable, directly or indirectly, according to changes in the physical environment, while there is some evidence that chemical excitation may play a part.

Influence of Respiration upon the Liver.—Concerning the condition of the liver in ordinary respiration, K. WALZ (Münch. med. Woch., May 13, 1902) designates as rest stage the period at the end of expiration when there is neither distention nor compression and the blood-flow is unimpeded though slow. The gall-bladder is lax and its contents remain *in situ*. The inspiration stage of the first degree occurs at the end of quiet inspiration and is absent in purely costal breathing. The convexity of the liver will now flatten, the blood and bile are driven out of the liver vessels and the laxity of the gall-bladder reaches its highest degree. In addition, two other stages may be noted with forced abdominal breathing. In the stage of forced expiration the blood is also compressed out of the vessels, but furthermore the gall-bladder is caught between the quadrate and right lobes and thus emptied. In the inspiratory stage of the second degree the effects are the same as those occurring in the first degree, but to a more marked extent, and the bladder is not compressed. It thus follows that the respiratory liver massage is of the greatest practical value in all cases in which there is stagnation of the bile or sluggish hepatic circulation.

EYE, EAR, NOSE AND THROAT.

Formol, Adrenal Extract, and Cocaine.—The preservation of solutions of adrenal extract and cocaine is a difficult matter unless one is employing large quantities and therefore necessarily keeps one's stock fresh. C. W. HEITZMANN (La sem. méd., May 14, 1902) finds that the addition of one drop of a 40-per-cent. solution of formaldehyde to 30 grams of either of these solutions constitutes a most excellent means of preserving them indefinitely. This applies especially to liquid preparations of adrenal extract and solutions of cocaine and eucaine. These substances thus employed can be used subcutaneously without giving rise to any symptoms of irritation.

Rodent Ulcer.—During the last eighteen months treatment of a number of inoperable cases of rodent ulcer by the X-rays with varying success has been carried out by G. G. S. TAYLOR (Lancet, May 17, 1902). Some have equalled, but none have excelled the following case: The patient, eighty-two years of age, a mercantile sailor, had suffered for twenty years or more from a small chronic ulcer on the right side of his nose, causing great pain, treated without benefit with the usual remedies. Six years ago Taylor himself applied caustic potash to the growth but without benefit. When first seen in May, 1901, all the typical clinical evidences of rodent ulcer were present, extending to the inner angle of the orbit and having destroyed portions of the lids, lacrimal canal and caruncle. Pain was at this time intense. The treatment was begun on May 15th. A current of three amperes was used for twenty minutes twice weekly. From June 12th the sittings were increased to four times a week. Up to August 19th healing had been very slow. On this date treatment had to be suspended because of the sharp reaction indicated by sudden appearance of dusky red erythema about the ulcer, attended by the destruction of the newly-formed epithelium upon its surface and of the surrounding epidermis, brought about possibly by change of the X-ray tubes from one of high vacuum to one of medium vacuum. It took five weeks for the effects of this reaction to disappear, when spontaneous healing began and was very rapid, for on October 15th the ulcer had cicatrized, with the exception of a small area which proved obstinate and where he believes the caustic potash had been used six years ago. On this date treatment by the X-rays was resumed, applied to this unhealed spot for only ten minutes three times a week. The newly-formed scar-tissue was specially protected from their action with double lead-foil shields. The treatment was completed by December 20th. At that time there was not the slightest evidence of disease and since then there has been no recurrence. It is interesting to note also that the conjunctiva of the everted lower lid and that of the inner canthus were covered with a smooth layer of opaque horny epithelium and no trace of the puncta remained.

A Foreign Body Remaining Long in the Air-passages.—A patient of Dr. SHVAGER-LEFFETSKY (Russky Vratch, N. 19, 1902) entered the hospital with what appeared to be croupous pneumonia, which seemed to have taken the normal course; the temperature became normal, but the consolidated part of the lung did not seem to resolve readily. Two weeks later the temperature rose again and in the subscapular region of the right lung there appeared symptoms of pleuritic effusion; puncture, however, did not reveal any fluid. For nineteen days the symptoms remained stationary, when the patient in the night, after a severe attack of coughing, brought up a foreign body, which on examination proved to be a piece of spongeous bone 1½ cm. long and 1 cm. wide. The subsequent examination revealed the fact that the patient most probably got the bone into his larynx some two years before. The bone most probably had lodged in the lower part of the right bronchus and secondarily infected the adjoining parts of the lung. After the foreign body was coughed up all the objective symptoms in the lung gradually disappeared.

Absorption Treatment of Cataract.—A valuable warning as well as inquiry has been started by J. W. WRIGHT of Columbus, O., in a letter to the June Ophthalmic Record. He points out that it has been his experience frequently to operate on eyes for cataract, which have previously undergone what is known as massage treatment for absorption of cataract, carried on in one case ten months. His observation has been that the cornea in these cases was "flabby, having lost its normal firmness." In at least seven of his cases he has had difficulty, due to the injury caused by this so-called "absorption treatment," which, he states, physicians have been recommending to be used for various eye-conditions. [It is hard for us to understand how physicians can recommend to their patients these dangerous experiments in specialties about which the scantiness of their knowledge should lead them to lean heavily on those whose study therein has been adequate.—ED.]

Labyrinth Deafness in Mumps.—Two new cases of this very rare complication of mumps are given by TEXIER (Rev. Hebd. de Laryng., d'Otol. et de Rhin., June 7, 1902). The first case was that of a boy of seventeen years, who became suddenly deaf in both ears eight days after the onset of mumps, involving both glands. The deafness was accompanied by tinnitus and vertigo, the latter lasting three or four days and being associated with vomiting. There was no measles nor running of the ears and nothing abnormal on examination except failure to hear watch, low voice, or tuning forks with either ear. No improvement in eight months. The second case, that of a sergeant in the French army,

twenty-three years of age, developed parotitis, first on right side and some days later on left side, with febrile movement. Tinnitus was present in the left ear and the hearing was lost on that side. The tinnitus was like a "breeze through leaves," increasing with noise or exertion. Vertigo came on, but gradually disappeared after some weeks. No syphilis nor other discoverable cause of deafness. No lesion in either ear on examination, yet he remained deaf. Deafness in these mumps cases is complete from the beginning, is accompanied by tinnitus, vertigo and vomiting, and is incurable. Usually the vertigo and vomiting are transient, but in the cases cited they were persistent for a long period.

HYGIENE.

The Mosquito and Yellow Fever.—In the light of recent developments, interesting reading is afforded in the copy of the original paper by C. FINLAY (Rev. de la Assoc. Med.-Far. de la Isla de Cuba, II., No. 6, 1902), in which he draws the following conclusions: (1) It has been proved that the Culex mosquito, as a rule, bites several times in the course of its existence, not only when its bite has been accidentally interrupted, but even when it has been allowed to completely satisfy its appetite, in which case two or more days intervene between its successive bites. (2) Inasmuch as the mouth of the mosquito is very well adapted to retain particles that may be in suspension in the liquids absorbed by that insect, it can not be denied that there is a possibility that the said mosquito should retain upon the setæ of its sting some of the virulent particles contained in diseased blood, and may inoculate with them persons whom it afterward chances to bite. (3) The direct experiments undertaken to decide whether the mosquito is able to transmit yellow fever in this manner have been limited to five attempted inoculations with a single bite, and they have given the following results: One case of mild yellow fever, perfectly characterized, with albuminuria and icterus; two cases diagnosed as abortive yellow fever by the physicians in charge; and two ephemeral fevers without any definite character. From these results it must be inferred that the inoculation with a single bite is insufficient to produce the severe forms of yellow fever, and that a final decision as to the efficacy of such inoculations must be deferred until opportunity is found for experimenting under absolutely decisive conditions outside of the epidemic zone. (4) Should it be finally proven that the mosquito-inoculation not only reproduces yellow fever, but that it constitutes the regular process through which the disease is propagated, the conditions of existence and of development for that insect would account for the anomalies hitherto observed in the propagation of yellow fever, and while one might, on the one hand, have the means of preventing the disease from spreading, non-immunes might at the same time be protected through a mild inoculation.

THERAPEUTICS.

Syphilis and Salicylate of Mercury.—The subcutaneous injections of salicylate of mercury have according to literature reached a very large degree of popularity in Germany, Austria, and Russia, but comparatively little in France. The method of preparing the drug ordinarily is one gram of salicylate of mercury in 10 or 15 c.c. of liquid vaseline. One c.c. of this mixture is injected every five or eight days. E. ORLIPSKI (La sem. méd., May 14, 1902) has found that it is preferable to inject ¼ or ⅙ of this dose, but to repeat the injections more frequently in such a way as to administer during the continuation of the treatment the same grand total of salicylate of soda as would be reached by the less frequent larger injections. This method presents the double advantage of assuring an active therapeutic effect and of decreasing the inconvenience which may follow any injection of mercury, such as nodosities, abscesses, pain, etc., all of which are more apt to be present when the dose is large. They also permit the avoidance of an accumulation of quantities, more or less considerable, of mercury in a few areas of the body and also the irritating effects which this drug has upon the organs of elimination, for example, the mucous membrane of the mouth and intestine, the skin, and the kidneys.

Yohimbin in Impotence.—Subcutaneous injections of this drug in cases of neurasthenic impotence have been used with success by EULENBURG (Deut. med. Woch., May 29, 1902). He uses a 2-per-cent. solution in distilled water which must be kept in a dark bottle and may be preserved by a drop of chloroform. He begins with a 5 c.c. (m. 8) of the solution injected into the inner surface of the thigh and increases rapidly to 1 c.c. (m. 16); at first daily, then every two or three days, stopping for a time when twenty injections have been given. No after-effects were observed except a slight chilliness and perspiration in a few cases. The effects are slow, the erections coming on from twelve to twenty hours after injection. The author finds the method safe and reliable in selected cases in which other means have failed.

Action of Dionine on the Eye.—This drug, which has recently been added to the ophthalmological amamentarium, is in reality the chlorhydrate of ethyl morphine, first discovered and studied by Grimaux in 1882. BRUNO (Jour. des sci. méd. de Lille, May 24 and 31, 1902) thus sums up the symptoms characteristic of the dionic reaction: Vasodilatation and vascular injection; lymphatic extravasation and edema; glandular excitation and lacrimation; sensation of burning, followed by analgesia. These effects are produced in their entirety solely in the diseased eye and in the healthy eye of cardiac subjects; the intensity of the reaction varying in individual cases. The favorable effects noted in a variety of ocular affections may, in the author's opinion, be attributed to its trophic influence. Perhaps its greatest value lies in its analgesic property, though it is in no sense anesthetic. The author denies any direct antiseptic influence of the drug, the opinion of other observers to the contrary notwithstanding, and attributes its mitigation of infectious processes to the increased lacrimation which it induces. Dionine may be used in solution or in powdered form, the analgesic dose being two drops of a 0.5 to 1 per cent. solution, repeated every two or three hours. In the treatment of affections in which greater reaction is desired a solution of from 5 to 6 per cent. is advised. The drug loses its effect in time, when constantly employed, therefore its application should be intermittent; or where its continued use is deemed necessary, its influence may be somewhat prolonged by application of warm compresses following its instillation. The writer has found it valuable in the following conditions: Superficial foreign bodies upon the cornea; the powder cleansing the cornea and preventing septic complications. In parenchymatous keratitis and granular pannus strong solutions should be used at first, the powder being used later on, and applications should be intermittent. In phlyctenular affections, ulcers, iritis, iridochoroiditis, and infected penetrating wounds, strong solutions or powder followed by instillation of atropine are to be used from time to time. This treatment should be supplemented by frequent analgesic instillations of weak dionine solutions. In glaucoma strong solutions are recommended, associated

with eserine and pilocarpine, dionine acting as an adjuvant to these drugs. Dionine, while having no direct effect upon the pupil, is a useful auxiliary to myotics and mydriatics, facilitating their absorption.

Treatment of Basedow's Disease.—The theory that certain poisonous substances formed in the body are neutralized by the secretion of the thyroid and that in Basedow's disease there is an overproduction of the secretion, has stimulated certain authors to treat this disease with the serum of dogs deprived of their thyroid. D. SCHULTES (Münch. med. Woch., May 20, 1902) had the opportunity to try this method in one case in which severe neutral symptoms formed the prominent feature. He reports favorably, since the acute dementia, swelling of the gland, tachycardia and tremor disappeared very rapidly, to reappear when the serum was discontinued. The dose was ½ to 4½ c.c., internally given three times a day. W. Goebel, in an article in the same number, states that he has obtained fair results with the milk of thyroidless goats. He reasoned that if Basedow's disease depends on a hyperfunction of the thyroid, the iodothyrin would represent the toxic agent and the amount of this formed can be reduced to a minimum by withholding from the patients food containing organically combined iodine.

Physiological Action of Cactus.—There are many drugs purported to possess the physiological actions of digitalis without its disadvantages, yet none seems to have gained universal favor. While studying the various heart-tonics T. VON ZELENSKI (Klin. therap. Woch., June 1, 1902) found that cactus grandiflora possesses many excellent properties which would merit its more extended use. The nausea and gastric disturbances which make the administration of strophanthus so difficult are entirely absent, nor were headache, insomnia or cumulative action observed. Changes observed in the pulse amounted to an increase in force and volume and a slight increase in frequency; the respiratory and renal systems did not seem to be affected and it is doubtful if any diuresis occurs other than that resulting from the improved circulation. The most gratifying therapeutical results that the author obtained were in incompensated aortic lesions in which the drug almost seemed to be a specific, while for mitral lesions digitalis proved to be better. In a number of other conditions, such as chronic pleuritic exudate and heart-weakness in infectious disease, cactus did good service. The proper dose is thirty minims of the fluid-extract three times daily.

Use of Expectorants.—The old dictum that alkalies are of value as expectorants in bronchitis is seriously doubted by M. SAENGER (Wien. klin. Rundsch., May 11 and 18, 1902), who finds that by inhalation these drugs never reach the deeper parts of the respiratory tract, and if taken internally they certainly do not affect the viscosity of the mucus. The only way in which an alkali could reach the finer bronchi would be by the inhalation of one which occurs in a gaseous state, namely, ammonia, but this is too caustic for practical purposes. Certain other drugs, however, can be used by inhalation and have a decided beneficial influence in that they stimulate secretion and thus carry off the old, inspissated crust. Among these are benzoin and menthol. The inhalation of aqueous vapor, while it diminishes irritation, does not possess this property. Secretion may be further stimulated in a number of physical ways, as by exercise, breathing of attenuated air in a pneumatic cabinet, etc. The simplest way for the physician, however, is by giving remedies internally and one of the best of these is hydrastine.

The Diastatic Ferment of the Suprarenals.—The discovery of Loewenhart that most of the tissues contain lipase has been closely followed by that of A. C. CROFTAN (Pflüger's Archiv für Physiol., May 12, 1902), namely, that diastase is to be found in the suprarenal capsules. This investigator treated a watery extract of the suprarenals of a sheep with ammonium sulphate and obtained a precipitate that possessed marked diastatic properties. He found that this ferment forms maltrose as well as dextrose, and that the quantity of dextrose formed depends on the quantity of suprarenal substance used and the duration of its activity. Comparing this diastatic ferment with that of the pancreas, the author discovered that the latter acts more quickly, but that the reducing power obtained with suprarenal extract is greater than that with extract of the pancreas. In this respect the former resembles more closely the diastase of the blood, and seems to occupy in a certain measure an intermediate place between the ferments of the pancreas and the blood. The suprarenals seem to contain two ferments, namely, maltose and glucose. If the precipitate obtained by the addition of ammonium sulphate to the watery extract of the suprarenals be kept for several hours in alcohol, the sediment is so changed that only a portion of it is afterward soluble in water. This solution is capable of forming maltose, but not glucose, for it appears that alcohol renders insoluble or destroys the glucose of the suprarenals as well as the glucose of the blood. The suprarenals either manufacture the diastatic ferments or filter them from the blood. The presence of diastatic ferments in the suprarenals to an extent nearly as great as in the pancreas seems to indicate that the suprarenals have something to do with the metabolism of glycogen and sugar. The author had recently shown that the formation of normal bile-pigments and biliary acids from hemoglobin and through the agency of the so-called "hepatic forment," is only possible in the presence of sugar or glycogen. He concludes that possibly the pigmentary anomalies seen so frequently in diseases of the adrenals indicate that these organs share in the metabolism of the carbohydrates. He also concludes that it is possible that all these circumstances can be brought into relation with the pathogenesis of suprarenal diabetes, and furthermore with the separation and storing-up of bile-pigments produced by the injection of suprarenal extract.

Strychnine as a Stimulant.—The employment of the sulphate of strychine as a stimulant of the circulatory and nervous systems is usually in doses too small to be adequate, according to the experience of TVOISFONTAINES of Liege (La. sem. méd., 1902, No. 23), for producing marked or sustained effects in cases of pronounced weakness of the heart and distinct nervous prostration. The ordinary quantity given hypodermatically would be 0.003 to 0.006 gram in twenty-four hours. This he increases to 0.008 to 0.010 or 0.015 gram divided into three, four or five exhibitions. Under such doses he has never seen any unfavorable local effects appear and never any symptoms of poisoning. It is at times well to combine with the strychnine the sulphate of sparteine in the daily dose of 0.15 to 0.20 gram. Given in these quantities and manner strychnine is of especial service in heart disease, syphilis with cerebrospinal lesions, acute edema of the lungs, pneumonia and the like, and may be continued for long periods. Among children this author has given strychnine in a daily dose of 0.001 gram to a one-month-old nursling for a whole week without any damage. These observations agree with those recently published by G. H. Whiteford of Plymouth to the effect that intramuscular injections of strychnine in large and frequent doses are serviceable to combat surgical shock after operations. During the operation itself their use is a safeguard against shock.

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HONORS FOR MEDICAL MEN.

THE *New York Tribune* in its Illustrated Supplement for Sunday, July 6, records under the title of "An Exalted Profession" some honors that have recently been conferred upon medical men. The writer is evidently of the opinion that the medical profession should be eminently well satisfied with the rewards in the form of titles that have of late years come to distinguished colleagues in many parts of the world. Much is made of the recent Coronation honors in this respect. An analysis of the reasons for which these honors were conferred does not, however, tend to make the ordinary professional medical man feel any special sense of complacency in them.

Sir Arthur Conan Doyle's knighthood was not conferred upon him because of any medical merits, although Dr. Doyle did professional work quite as faithfully as did many others in South Africa, but because of his literary reputation and the fact that he has presented very ably the British side of the controversies with regard to South African affairs. Sir Francis Laking has been the personal physician of the Prince of Wales, now King, for many years and is a close friend of the new monarch. His baronetcy is a tribute to friendship and position, not to professional merits. Sir Frederick Treves' name is said not to have been on the original list for Coronation honors before the King fell ill and required his surgical services. Under the circumstances King Edward could scarcely have passed over the man to whom at the moment he was compelled to trust his life.

While the writer for the *Tribune* feels that the medical profession has many reasons for self-congratulation because of the improvement in its social status ever since the early days of the Victorian era, when physicians were not considered to be of the class that one would invite to dinner or social functions generally, medical men are apt to look at the matter more as did our special London correspondent in a recent letter. The physicians of the Royal Household did not, it seems, receive invitations to the Coronation ceremonies that were to be in Westminster Abbey although most of the rest of the household did. This is only according to the traditional usage in the matter, but it shows that the old sense of social indignity with regard to the profession still holds. It is certainly true that in the armies and navies of the world the surgical staff are still under a certain ban of social inequality in comparison with brother officers of the same rank and length of service. In England this is carried to such an extent that medical officers are systematically blackballed at military clubs. At the English court it is understood that officers having the title of Honorary Physician or Surgeon to the King, although the honor has been bestowed on them in recognition of especially meritorious service, are not invited to be present at court functions.

The medical profession may well steer clear, then, of any feelings of self-complacency in the matters of honors that have recently been conferred on colleagues. As a matter of fact honors usually come for personal services to royalty and in this it is well known that the rewards are never commensurate with the risks, as many a physician has found to his cost.

At the beginning of the last century Sir Richard Croft committed suicide because of the popular feeling against him. It was assumed on utterly inadequate grounds that he had not treated the Princess Charlotte of Wales as skilfully as he should. A distinguished German obstetrician of Berlin is said to have ruined his career and spoiled his chances of a Professorship in the German Universities because of the unavoidable accident that crippled for life at his birth the pres-

ent Emperor of Germany. In our own time one distinguished Russian physician is said to have taken his own life because of the hue and cry among the Russian populace against him for not having saved the life of the late Russian Emperor. How high popular feeling ran in this matter can be judged from the fact that the house of an equally distinguished Russian colleague in Moscow was wrecked by the mob, and he narrowly escaped with his life. Here in the United States the physicians of wounded Presidents have learned well the bitter lesson how uneasy lies the head in attendance on patients in high position.

That honors and social rights and distinctions should come to the members of the medical profession is no more than right seeing that their services are not only so much in demand but so valued by those high in authority, and even the suspicion of failure is apt to be visited on them so severely.

As a matter of fact phvsicians the world over are doing more for the benefit of nations and peoples, we believe, than any other class of men and many of them are doing it without a thought of the reward. The medical profession, as has been well said, is the only class of men who are working effectively to limit the necessity for their own services.

It is to such benefactors that honors should come. At present honors are absorbed almost exclusively by two classes of the community—the military and the politicians. We have surely passed the intellectual stage when we are to be persuaded that only those who benefit a country by winning her battles, or by outwitting the diplomats of other countries, deserve to be honored. Peace hath her victories and the realization of this is coming to all men. In peace the medical sanitarians of our generation are saving as many lives now as the fighters sacrificed in former generations and are decreasing the great sum of human suffering by more than they increased it.

Perhaps the true realization of how valuable this work is will only come when medical men are closer to the ruling powers than at present. Our own Dr. Leonard Wood has shown how marvellously effective for good health and good government the combination of governor and physician may be. The present Queen of Portugal rejoices in the privilege of having by right the title doctor of medicine after her name. There is a Duke of Bavaria, a brother of the late Empress of Austria, who has done much good as a physician. Not long ago the London *Lancet* suggested that one of the three boys of the Prince of Wales should be reared as a physician and gave as its reason the fact that "the English medical profession has long merited acknowledgment and the finest acknowledgment would be the enrolment in their body of a prince of the blood." It would seem that juster views of medical merit than now obtain would thus become more disseminated, and there would be less reason for the complaint that the true value of their services and the responsibilities they assume is generally ignored. As physicians we cannot but rejoice at the better position in popular estimation and authoritative appreciation that the profession occupies, but we are not of the opinion that even as yet things are quite as they should be in this respect. It lies with ourselves to make them so.

"THE UNKINDEST CUT OF ALL."

THAT medicine should resolve itself into specialties has been a foregone conclusion, from the increase of knowledge in all branches and, the enlargement of the field of investigation, and that the extension along these lines should be surgical, rather than medical, is only natural. The question now is, have we not already reached our limit of operative interference in most of the well-defined specialties, and is not the tide of professional feeling setting rather in favor of an armed neutrality, than to an appeal, in all cases, to the knife?

Certainly in ophthalmology the revulsion has been great, and the number of "advancements" rendered necessary in muscles that were ill-advisably cut for the cure of all neurotic conditions—from epilepsy to "eye-strain"—is growing steadily less, while the partial division and "stretching" of the recti muscles have been practically abandoned, even by the smaller number of its disciples whose enthusiasm was greater than their experience. So too, in otology, where the removal of the ossicles ran a brief and disastrous course, and where, too, the insertion of an eyelet in the thickened drum head seemed to promise a speedy relief to the deafness of middle ear trouble; a flattery that only served to soothe the dull, cold ear of death, in more cases than one, by the untoward falling inward of the mechanical device.

It is, however, in abdominal and pelvic surgery that the advance has been the most marked, for it is here, without question, that the greatest results have been attained. That hundreds of lives have been saved by a timely operation for appendicitis can not be denied, and yet it is also true

that in many cases no disease of the appendix has been found when the abdomen has been opened, and that consequently these patients have been subjected to an operation that was unnecessary, even if the skill of the operator had been sharpened by practice to a degree sufficient to remove all risk of a fatal termination. So also with women and the ovaries; that their removal is often necessary to preserve life is a fact beyond doubt or cavil, and yet when we remember that the procedure must affect their nature and disposition, we can not but think that it is often undertaken too lightly and on insufficient ground. The time that has now elapsed since the more general introduction of the operation is sufficient to have demonstrated that it is often followed by a general coarsening of the whole organism—mental as well as physical—and though this may not be a general rule, yet there are few among us who have not in our own experience seen sufficient exceptions to prove that it is one.

But be this as it may, the fact still remains that the investigations of the present day—broad though they may be—are being pushed along a path so narrow that it seems that sooner or later they must converge and meet at a point where most diseases will be divided into two great classes—first those of the brain and nervous system, that are to be done away with by what the refractionist is pleased to term "the proper installation of glasses," and last, the sum total of all the ills that female flesh is heir to—which are to be cured—rather than endured—by oophorectomy, or the removal of the ovaries.

The most striking example of this latter is not only its suggestion, but the practical application of it for the cure of cancer of the breast. What possible relation there can be between the two it is hard to imagine, though that there is a nervous connection between them is a fact, the knowledge of which is not confined to the medical profession; but that the removal of the one will check the progress of the malignant growth in the other, seems apocryphal in the extreme. As early as 1896, Beatson exhibited two cases before the Edinburgh Medical Society that had been so operated on, one of whom, a year later, seemed to have recovered completely from an absolutely inoperable condition, but Butlin reviewing the literature of the subject comes to the conclusion that "there is little evidence to prove that oophorectomy can cure any woman of cancer of the breast."

In further support of this opinion we have only to quote from the recent paper of Paton (*British Medical Journal*, March 1, 1902), who reports two cases. The first of these was a woman of forty-three, who had been suffering from a tumor of the breast for three months, the entire region being infiltrated and the axillary glands involved. The breast was extirpated, but the growth recurred in the scar and ulcerated, and the other breast becoming involved, the ovaries were removed. The patient was put on thyroid extract and this was continued for some weeks, but the combined treatment had no apparent beneficial effect. The second case was of a woman of thirty-one years with extensive cancerous involvement of the breast and glands. All the affected tissue was removed and oophorectomy performed, but the disease reappeared and the patient died.

That there have been many cases reported in which there was supposed to be an amelioration of the conditions, and even cure, is true, but in putting our faith in statistics and the lessons which they teach, two things must be borne in mind. Cancer is a progressive trouble of the most pronounced kind, and yet even in its most malignant form it is subject to arrest of growth, and exceptionally to even spontaneous involution, and this without treatment of any sort; so that it is easy to credit this improvement to the effect of the operation or to the curative influence of the thyroid extract with which the patients have been saturated. Again, even with the best of motives, the most honest of observers naturally attach more importance to the success of any proposed line of treatment than they do to its failures—there being more joy for the one ewe lamb that has been apparently saved than sorrow for the ninety-and-nine that have fallen by the wayside. So that we can not help believing that were all the operations that have been done for this purpose reported and their results tabulated, it would be found that the weight of evidence against their efficiency would be overwhelming, and that the operation would be relegated from a present administration of strenuous activity to a previous one of innocuous desuetude.

ECHOES AND NEWS.

NEW YORK.

The Committee on the Prevention of Tuberculosis of the Charity Organization Society of the City of New York.—The Charity Organization Society's Committee on the Prevention of Tuberculosis needs not less than $10,000 to meet the expenses of the work which it has undertaken. Contributions made to the Society for its usual current operations should not be

reduced and cannot be diverted in any large amount to the purposes of this Special Committee. The expenditures to be made by the Committee are for the following main objects: (I.) Research into the social—as distinct from the medical aspects of tuberculosis—for example, into the relations between the disease and over-crowding, infected tenements and unhealthy occupations, and also into the influence of improved diet and hygienic living upon recovery. (II.) *Education.* The publication of leaflets and pamphlets, the giving of lectures and the promulgation in every possible way of the fact that tuberculosis is a communicable and preventable disease; the widest distribution of the results of scientific research in this field, and of the results of modern treatment both in sanatoria and at home. (III.) The encouragement of movements for suitable public and private sanatoria both for advanced and for incipient cases; for adults and for children; for free care and also for the care of those who can pay moderate fees. (IV.) The relief of indigent consumptives by the provision of suitable food and medicines, by the payment of rent when this is necessary to secure adequate light and air, and by transportation and maintenance at a distance when in the judgment of the Committee this is essential; the labors of the Committee will be directed not only towards the amelioration of the condition of the large class of consumptives, but also towards the benefit of the community as a whole, in which there is encouraging reason to believe that tuberculosis may be practically eradicated. The work of the Committee is not intended to be a temporary matter, but its continuance and effectiveness will depend upon the public encouragement and support received. For research and publication the Committee can easily make use of the $10,000 asked for, and could employ a larger sum to good purpose. In the relief of special cases existing agencies will be asked to cooperate, but any funds which individuals may be willing to supply for this special purpose, will lessen the burden upon organizations which are already over-taxed by cases of need arising in large numbers from the class of consumptive poor.

Contributions should be sent to the Charity Organization Society, 105 East 22nd Street, New York City. The Committee consists of the following: Charles F. Cox, Chairman; Otto T. Bannard; Hermann M. Biggs, M.D.; Herbert S. Brown; Joseph D. Bryant, M.D.; Miss Ella Mabel Clark; Robert W. de Forest; Edward T. Devine; Homer Folks; Franklin H. Giddings; Henry Herbert, M.D.; J. H. Huddleston, M.D.; Robert Hunter; Walter B. James, M.D.; E. G. Janeway, M.D.; Miss A. B. Jennings; S. A. Knopf, M.D.; Alexander Lambert, M.D.; Ernst J. Lederle; Mrs. Frederic S. Lee; Egbert Le Fevre, M.D.; Henry P. Loomis, M.D.; Mrs. James E. Newcomb; Eugene A. Philbin; T. Mitchell Prudden, M.D.; Andrew H. Smith, M.D.; W. G. Thompson, M.D.; E. L. Trudeau, M.D.; R. C. W. Wadsworth; Miss Lillian D. Wald.

Mosquito Warfare in Flushing.—The example of the North Side Improvement Association of Long Island has fired the citizens of Flushing to declare war on the mosquito. A committee appointed by the association, of which Arthur H. Elliott, Ph.D., is chairman, has issued a circular, bearing on its cover a portrait of heroic size of the enemy, and dedicated to "The Mosquito Brigade." The circular modestly says: "It is not supposed that the committee will undertake to exterminate all the mosquitos on Long Island. It is proposed to deal with those around us. These we expect to materially reduce in numbers. We expect every good citizen to take care of his own premises and will gladly tell him how to do so."

PHILADELPHIA.

Hospital Trustees Appointed.—Governor Stone has appointed Dr. Joseph Thomas of Quakertown and Samuel L. Thompson of Philadelphia, members of the Board of Trustees of the Norristown Hospital for the Insane.

Historic School for Blind to be Dismantled.—The old school for the blind at Twentieth and Race streets is to be remodeled and converted into an orphan asylum, it having been purchased for the St. Vincent's Home for Infant Children. The blind were taught in the old building from 1836 to 1899, when the school was removed to Overbrook, where it occupies the most complete building ever erected for such a purpose. From 1851 to 1854 James G. Blaine was a teacher in the school. Among its famous graduates are David Wood, the organist, and Adam Gribel, the composer. Another noted graduate was David Longbery, who afterward founded the school for the blind at Baltimore.

Pennsylvania Delegates to National Prison Congress.—Among the Pennsylvanians appointed by Governor Stone to represent the State at the National Prison Congress to be held here September 13-17 are the following from Philadelphia: Arthur H. Love, Conrad B. Day, George Vaux, Alexander Balfour, James H. Gay and D. W. Bussinger.

Philadelphia Hospital Changes.—Chief Clerk Robert H. Smith has been appointed acting superintendent of the Philadelphia hospital in place of William M. Geary who is on leave of absence because of illness. It is said that Mr. Geary will soon resign the superintendency.

Historical Society at West Penn. Medical College.—An organization having for its primary object the study of the history of medicine and medical men, has been formed at the West Penn. Medical College, Pittsburg, with Dr. W. H. Ingram as president. Both teachers and students will be active members. The medical library of the University has been turned over to the use of the society as a nucleus for the large library which is projected. Meetings will be held bi-monthly.

Mayor Vetoes Hospital Site Bills.—Mayor Ashbridge is being commended by the press and people of the city for his vetoes of the Petty's Island and Cannonball Farm bills, the former location as a site for the almshouse and insane asylum and the latter for the proposed new municipal hospital. Petty's Island is objectionable because "there would be brought about the anomalous condition of a strictly municipal institution operated under police and sanitary regulation and laws of another jurisdiction. It is deemed unwise for the city of Philadelphia to locate buildings or institutions, the control and erection of which are not wholly within its own discretion." The bounds of the Cannonball Farm property are stated to be too vague and indefinite, and the character and location do not make it desirable for municipal hospital purposes. The latter question will be taken up again immediately when councils meet in October.

Smallpox in the State.—During the week ending July 26 only four new cases of smallpox were reported in this city, the smallest number in a similar period since the epidemic began nearly two years ago. All these cases were located in districts where great difficulty has been experienced in inducing the people, especially the foreign element, to submit to vaccination. In Pittsburg the disease is rapidly increasing, 269 cases having developed during the last two months. In addition to 150 patients in the pest house, forty-two houses are under quarantine. The vaccination order has been placed in force again. At Collingdale, near Philadelphia, two negro camp meetings were closed July 26

by the Board of Health, under authority of the State Board. Action against two other meetings in the same county is contemplated.

CHICAGO.

Tetanus at County Hospital.—Out of the thirty cases of tetanus that have been treated at the County Hospital during the last five years, all but two have proved fatal.

Appointment of Health Commissioner Reynolds.—Dr. Arthur R. Reynolds, Health Commissioner of Chicago, has been appointed a delegate to the Third International Sanitary Conference, to be held in Washington, D. C., October 15.

Appointment of Dr. E. J. Gardiner.—Dr. E. J. Gardiner has been appointed professor of ophthalmology in the Chicago Eye, Ear, Nose and Throat College.

Mid-summer Work in Tenement House Districts.—Less than a baker's dozen of physicians have responded to the appeal of the Health Commissioner for midsummer work in the tenement house districts. The need for this work threatens to be more urgent this year than for many previous years. The unusual weather conditions are playing havoc with infant and child-life. Last week there were one hundred deaths from acute intestinal diseases alone reported, 73 per cent. of which were among those under one year of age, as compared with only 59 during the previous week, and the total deaths under five years of age form nearly 38 per cent. of the total mortality.

Hospitals Well Equipped.—Final reports were received in the building department July 21, concerning the equipment of hospitals. Deputy Commissioner O'Shea said that all the hospitals, with the exception of the Alexian Brothers', needed fire protection, but that all this had been remedied. Every hospital has complied with the instructions of the building inspectors.

Smallpox.—A marked increase of smallpox in the territory surrounding Chicago is noted, and five new cases were discovered in the city during the week, three of these being imported from beyond the city limits.

Arrest of a Dr. Miller.—Dr. Orlando E. Miller, who has just been arrested at the instance of the State Board of Health, on a charge of practising medicine without a license, was the proprietor of the St. Luke Sanatarium, in which ten men were recently burned to death. He has had a varied career, in which he has figured as an editor, a grocer, a patent medicine man, and a president of a branch Y. M. C. A. Dr. Miller is noted for his highly religious tendencies, and his activity as a psalm-singing revivalist.

CANADA.

Consumption Sanatorium Closed.—The Highfield Consumption Sanatorium, which has been conducted at Moore Park on the northern confines of the city of Toronto by Dr. Edward Playter, has been ordered closed by the local board of health. The residents of the district did not like the presence of consumptives in their midst.

New Brunswick Medical Society.—The twenty-second annual meeting of the New Brunswick Medical Society was held at St. John on July 15 and 16. Amongst others who contributed papers were: Drs. A. B. Atherton, Fredericton; C. R. Shaughnessy, Laughlin, Milton and McLaren of St. John; C. M. Campbell, Halifax, and Lawson of St. Stephen.

Medical Society of Nova Scotia.—The thirty-fourth annual meeting of the Medical Society of Nova Scotia was held at New Glasgow on July 2 and 3, under the presidency of Dr. John W. McKay of New Glasgow. Next year the society will meet at Antigonish. The following were the officers elected: President, Dr. J. J. Cameron, Antigonish; 1st vice-president, Dr. W. G. Putnam, Yarmouth; 2nd vice-president, Dr. M. Chisholm, Halifax; secretary-treasurer, Dr. Huntley McDonald, Antigonish.

The Maritime Medical Association.—This Association held its twelfth annual meeting at Charlottetown, P. E. I., on July 9 and 10. Dr. W. B. Geikie, Dean of Trinity Medical College, Toronto, was present and delivered an address on simplicity in treatment. Dr. H. D. Hamilton, Montreal, and Dr. Stoddart, Pueblo, Colorado, were also present, and contributed papers. The following were the officers elected: President, Dr. Murray McLaren, St. John, N. B.; vice-president for P. E. I., Dr. P. C. Murphy, Tignish; vice-president for Nova Scotia, Dr. G. M. Campbell, Halifax; vice-president for New Brunswick, Dr. R. L. Botsford, Moncton; secretary, Dr. T. D. Walker, St. John; treasurer, Dr. C. A. McPhail, Summerside, P. E. I.

Infantile Mortality in Montreal.—During the week ending July 19 there were no less than 108 deaths among infants in Montreal. This was a larger percentage than for the previous week. The total number of deaths during that week was 167. Of this number 151 were Catholics, eleven Protestants and five Hebrews. The Medical Health Officer points out that in order to reduce the number of deaths among infants, the privy pits in the city will have to be reduced.

Prominent Doctor Killed.—Dr. J. H. Horsey, Owen Sound, Ontario, Liberal Member of the Dominion House of Commons, was almost instantly killed on the afternoon of July 23, in the Owen Sound Cement Works, through the bursting of a fly wheel. Dr. Horsey was a graduate of Queen's University and took a deep interest in the welfare of that institution.

Lunatics in the Dominion.—A bulletin issued from the Census Department at Ottawa on July 26, states that there are 16,495 of unsound mind in the Dominion of Canada. Of this number 13,929 are males and the balance females. There are in addition, 6,174 deaf and dumb and 3,279 blind. Ten years ago the record was 13,355 of unsound mind and 4,819 deaf and dumb, and blind 3,368. Of the 25,948 infirm persons, 5,269 have been so afflicted since childhood.

Ontario Medical College for Women.—The past session at this institution has been a very successful one. There were eight members of the graduating class and five of these have secured hospital appointments in American hospitals, as follows: Dr. Emma Connor is at the Women's Hospital, Philadelphia; Dr. Elizabeth McMaster and Dr. Isabella Thomson are at the West Philadelphia Hospital for Women; Dr. Isabella Wood is at the New England Hospital for Women and Children, Boston, Mass.; Dr. Lazelle Anderson is at the Children's Hospital, Staten Island, New York.

Doctors Elected to the Ontario Legislature.—By the recent elections held in Ontario the following members of the profession have secured seats in the Legislature: Dr. J. A. Reaume, to represent North Essex; Dr. David Jamieson, South Grey; Dr. E. Jessop, Lincoln; Dr. F. S. Snider, North Norfolk; Dr. W. A. Willoughby, East Northumberland; Dr. R. A. Pyne, Registrar of the Ontario College of Physicians and Surgeons, East Toronto; Dr. Beattie Nesbitt, formerly editor of the Dominion Medical Monthly, North Toronto; Dr. H. G. Lackner, North Waterloo; Dr. G. A. Routledge, East Middlesex; Dr. S. Bridgland, Muskoka; Dr. M. James, East Nipissing, and Dr. M. Currie, Prince Edward County.

Personals.—Dr. J. A. Roberts has returned to Toronto from the South African battlefields. Dr. Arthman A. Bruere has resigned the chair of physiology in Bishop's Medical College, Montreal. Dr. W. G. Turner has been appointed superintendent of the Montreal

Western Hospital, replacing Dr. von Eberts. Drs. Wright, Graham and Waters have been appointed on the house staff of the Sick Children's Hospital, Toronto. Dr. R. F. Ruttan has been appointed professor of chemistry at McGill University. Dr. O. W. Colbeck, late of the Western Hospital (Toronto) house staff, has been appointed house physician to the Mount Airy Sanatarium for Children, Baltimore, Md. Dr. E. R. Secord of Brantford, Ont., who has been in England and Italy some months for the benefit of his health, has returned to resume practice. He has been elected a Fellow of the Edinburgh Obstetrical Society.' Dr. J. L. Todd of McGill, will proceed to Senegambia to study the animal parasite trypanosoma and its connection with disease in human beings. He is being sent out by the Liverpool School of Tropical Medicine and is to be associated with Dr. J. E. Dutton of that school.

GENERAL.

British Medical Association.—The seventieth annual meeting of this association took place in Manchester, July 29, 30, 31 and Aug. 1. The meeting was an exceptionally successful one and many papers of interest and importance were read. The opening addresses of the President and of the Chairman of the Section on Tropical Diseases are presented in this week's issue of the MEDICAL NEWS.

Vaccination in Turkey.—A royal edict has been issued, by virtue of which, vaccination is rendered obligatory throughout the empire of Turkey.

The Sleeping Sickness.—A commission has been sent from London to Uganda for the scientific study of this disease. The commission is composed of Drs. G. C. Low and C. Cristy, who will investigate the condition from the parasitic standpoint, and Dr. Castellani, who will study the malady from the bacteriological side. The disease has killed 40,000 people in Busoga; and in the district of Kragone 400 deaths in two months and 2,000 in six months have been recorded.

Cholera Steadily Increases in the Philippines.—Latest reports received from the chief quarantine officer for the Philippines, show plainly that up to the time of writing little progress had been made against the ravages of cholera. In some of the villages, he says, one-tenth of the entire population have died from cholera. The report for Manila from May 25 to June 7, inclusive, shows a startling number of fatalities, larger in proportion even than in the provinces for the same period. During these two weeks there were reported 132 cases and 118 deaths. In the provincial towns for the same period there were 1,108 cases and 722 deaths. In Manila during these two weeks four Americans were attacked by the disease, but no fatalities were reported.

An Aged Practitioner.—Dr. Harry Helfrich of Altoona, Pa., celebrated his ninety-ninth birthday on July 26. He is the oldest resident of Lehigh county and the oldest physician in active practice in Pennsylvania. He no longer visits patients, but he still has considerable office practice.

Physicians and Leprosy.—The Board of Health of Honolulu, which recently removed Dr. Oliver, resident physician at the leper settlement, has received application from forty physicians living in many States of the Union for the place made vacant. All are anxious to study leprosy. Prof. Clarence A. Good of Michigan University is likely to be appointed, he having been previously invited to come here.

A New Medical Journal.—We have received the first number of the Old Dominion Journal of Medicine and Surgery. It is the official organ of the Alumni Society of the Medical College of Virginia and will draw its clinical material from the City Dispensary and the largest hospital between Baltimore and New Orleans. We have as active cooperators the teaching force and Alumni of the thirteenth oldest medical school in the United States.

The Ozark Sanatorium.—Owing to the recent death of his father, Dr. J. T. Jelks of Hot Springs, Arkansas, Dr. F. W. Jelks will leave St. Louis and take up his father's work at the Ozark Sanatorium.

American Association of Obstetricians and Gynecologists.—This Association will hold its fifteenth annual meeting in the Convention Hall of the Hotel Raleigh, Washington, D.C., Tuesday, Wednesday and Thursday, September 16, 17 and 18, 1902, under the presidency of Dr. Edwin Ricketts, of Cincinnati. The following-named papers have been offered: President's address, Edwin Ricketts, Cincinnati. Normal saline solutions during abdominal operations, Wm. H. Humiston, Cleveland. Further notes on ovarian transplantation, Robert T. Morris, New York. Surgery of the ileocecal valve, N. Stone Scott, Cleveland. Ice following abdominal sectjons, Frank F. Simpson, Pittsburg. Etiology and prophylaxis of traumatism of the female pelvic tract following labor, E. J. Ill, Newark. Pelvic disease in the unmarried, C. L. Bonifield, Cincinnati. Report of a few cases of operation for peritoneal tuberculosis with remarks, Rufus B. Hall, Cincinnati. Suppression of urine as a post-operative condition, T. J. Crofford, Memphis. Occipito-posterior positions, J. M. Duff, Pittsburg. Intestinal anastomosis, J. A. Lyons, Chicago. Retained placenta due to uterine fibroids, with cases, M. A. Tate, Cincinnati. Hydramnion with report of a case, E. F. Fish, Milwaukee. (*a*) Personal experiences in the use of the angiotribe; (*b*) Two fatal cases of tetanus, following abdominal section, Walter B. Dorsett, St. Louis. A second contribution to the treatment of gastric ulcer, Henry Howitt, Guelph. Hemorrhagic cysto-sarcomata of the ovary; their infectious character, J. B. Murphy, Chicago. General consideration of drainage in abdominal and pelvic surgery, Joseph Price, Philadelphia. Surgical relations that the appendix region or zone bear to pelvic suppuration and operative complications, Joseph Price, Philadelphia. Infantile intestinal diverticula, Joel W. Hyde, Brooklyn. Myomectomy vs. hysterectomy, C. C. Frederick, Buffalo. Anterior transplantation of the round ligaments for uterine displacements, A. H. Ferguson, Chicago. The cases of peritonitis which recover after operation, Wm. E. B. Davis, Birmingham. Dystocia following ventrofixation of the uterus, William H. Wenning, Cincinnati. Surgery of the ureters, C. R. Dudley, St. Louis. Curetage in streptococcus infection of the uterus, D. Tod Gilliam, Columbus. A new operation for displaced kidney with report of cases, Charles A. L. Reed, Cincinnati. Cancer of the large intestines with special reference to Mikulicz's method of resection, M. Stamm, Fremont, O. A short review of the advances made in intestinal surgery, James F. W. Ross, Toronto. Ectopic pregnancy, H. D. Ingraham, Buffalo. Unusual cases of appendicitis, Miles F. Porter, Fort Wayne. Pelvic abscess and its treatment, H. E. Hayd, Buffalo. Ruptured pus tubes, Charles G. Cumston, Boston. Title to be announced, H. O. Pantzer, Indianapolis. Gastrectomy with report of two cases, A. Vander Veer, Albany. Four cases illustrating the difficulties of diagnosticating appendicitis, William Wotkyns Seymour, Troy. The vaginal route for operations on the uterus and appendages, with cases, Jos. H. Branham, Baltimore. The management of cases of emergency arising from rupture in ectopic pregnancy, A. P. Clarke, Cambridge. Some unsettled questions in the surgery of the appendix, John Young Brown, Jr., St. Louis. Deciduoma malignum, with report of a case, L. S. McMurtry,

Louisville. Relationship of the colon to abdominal tumors, James F. Baldwin, Columbus. Some problems in exploratory laparotomy, Walter B. Chase, New York. Extirpation of the gall-bladder, through the lumbar incision; with report of a case, W. P. Manton, Detroit.

CORRESPONDENCE.

OUR BERLIN LETTER.

BERLIN, June 15, 1902.

ACADEMY OF SCIENCE EXPOSITION—THE EXHIBITS—THE LECTURES—DOYEN AND HIS KINEMATOGRAPH—VIRCHOW'S HEALTH AND RESIGNATION—ELECTION OF WALDEYER—DEMENTIA PARALYTICA.

A unique and novel exposition, the first of its kind, is closing its doors to-day. It was held in the Royal Academy of Sciences and all appliances of medical instruction have been exhibited. Originally only to be open for one week, the interest shown was such that the time was extended eight days and it is acknowledged that the exposition was a complete success, which no doubt will lead to improvement in different branches of medical teaching.

The president of the society is Prof. v. Bergmann, the secretary Dr. R. Kuttner, who was given the title of "Professor" in recognition of his efficient work. This elevation gave a well-known medical author an opportunity for the somewhat caustic remark that now all sorts of professors are in existence in Germany, viz: University, Gymnasium, Music, and finally now Exposition professors. Kutner, however, is not without merit; he has always been especially interested in cystoscopic work and was the first, in 1891, to photograph the inside of the human bladder. The exposition was arranged in six different groups: (1) Anatomical and pathological model preparations; (2) Phantoms and plastic models; (3) Tables and Charts, including Photography and Radiography; (4) Microscopy in all its branches; (5) Apparatus for Demonstration; (6) Projection Apparatus.

In addition lectures were provided for on eight consecutive nights by the following eminent men: (1) Prof. v. Bergmann upon the means of medical instruction; (2) Prof. Doyen of Paris (France) upon the development of surgical technic and methods; (3) Prof. Jolly upon the pathology of brain and spinal diseases; (4) Prof. v. Leyden, demonstrations of diseases of the heart; (5) Prof. Wassermann upon Bacteriology and Serumtherapy; (6) Prof. Liebreich, Pharmacology; (7) Prof. v. Michel, Tuberculosis of the Eye; (8) Prof. Olshausen, Diseases of Women and Obstetrics.

A feature was the lecture of Prof. Doyen, who used the kinematograph to show five capital operations, which were performed by him almost without assistance in one and one-half hours. Among these were the opening of the skull and removal of a cerebral tumor; an amputation of the thigh; a laparotomy, etc.

It might here be mentioned that Doyen, as a rule, in cranial operation, divided these in two parts. He trephines one day, closes the opening by suturing the skin and waits five days for the further work. He claims that he has much less loss of blood and better results.

In the first group of exhibits, the different branch institutes of the Berlin University, Allsaints Hospital of Breslau and a number of specialists were represented. The immense progress which the technic of preservation of anatomical and pathological specimens has made, culminating in the Kaiserling method, which enables one to give anatomical preparations an almost fresh appearance, through retaining their natural color, was demonstrated. The improvement was splendidly seen in exhibited specimens from the Pathological Institute representing: Amyloid degeneration of the liver, intestine with typhoid fever ulcers, liver with cancerous metastases and atrophy of the spleen.

In Group II. were shown plastic models, which form now an important factor in medical instruction. They give the teacher a chance to demonstrate all phases of the different diseases in an almost natural picture. As material principally wax is used, but papier-mâché and plaster of Paris are also frequently employed. Diseases of the skin, eyes, nose and throat among others are well represented in this chromo-plastic exhibit.

In Group III. were shown graphic demonstrations in woodcut, copper engraving, etching and lithography. Especially to be mentioned were tables of the psychiatric and neurological clinic of Prof. Jolly and charts of the topography of nervous and systematised Dermatoses of Dr. Blaschko. Interesting were also the plates of Dr. Engel representing the microscopical composition of the blood in the different forms of leucocytosis, leucemia and anemia, and stained with triacid, eosin-methylene blue, respectively.

In Group IV. the progress of microscopical technic and microscopy was demonstrated with a special exhibit of bacteriology and serumtherapy. The last thirty years has given to the scientist the Abbe condensor and the oil immersion, without which many conditions, which are recognized now, would have been yet a sealed book.

Dr. Rosin, Prof. Senator's first assistant, exhibits here new dye methods. (1) Demonstration of Nissl's granula with neutral red; (2) demonstration of lipochroms of nerve-cells with sudan and osmium and others.

In Group V. phonographs used to demonstrate defects of speech, especially stammering, were exhibited; also Roentgen apparatus, skiascopes, demonstration ophthalmoscopes, etc.

The last group dealt with the development of the projection apparatus. It showed the original magic lantern as invented by the Jesuit, Kirchner, in the middle of the seventeenth century, which was improved in 1840 by Petzval by his portrait objective; then came the change in illuminating material, oil was superseded by calcium light, acetylene and electric light and in connection with Edison's kinematograph, not only objects and drawings or photographs are truthfully shown, but moving pictures likewise.

Prof. Rudolf Virchow has left Tiplitz and is sojourning at Harzburg, an elevated but quiet summer resort. He could walk a short distance from the railroad without any support excepting his cane.

Some weeks ago, Virchow resigned as first president of the Berlin Medical Society, and probably through the influence of Prof. v. Bergmann, who had been first vice-president, but received Virchow's place, Prof. Waldeyer was elected for the vacancy. This has given rise to some adverse criticism, inasmuch as many members claim, a chairman of a medical society ought to be a clinician, not a teacher of anatomy. Waldeyer, when the question of contributing to the medical chambers came to him, refused or showed his unwillingness, claiming that he was not a practitioner.

At the Hufeland Medical Society (one of the oldest Berlin societies), Prof. Mendel, the alienist, delivered a few days ago a lecture entitled, "Our Present Knowledge of Dementia Paralytica." Mendel spoke about the connection between paresis and lues. In 1879 he pointed this out, but he then found no friends to support his view. About the exact pathology many things

are obscure yet, but he explains the pathological changes in the brain through minute alterations of the blood vessels, through which endosmosis and exosmosis are somewhat prevented, hence the brain substance is not properly nourished and degenerations must follow. He mentioned that the symptoms of dementia paralytica had somewhat changed. While formerly monomanie du grandeur et de la richesse was an almost permanent symptom, at present the dementia came more into the foreground. Women are much more frequently attacked than formerly; twenty years ago one woman came statistically to eight men, now the ratio is about one female against three males. The children resulting from paralytic marriages, born before the outbreak of the malady, showed imbecility as a rule, and sometimes depraved instincts. As to the prognosis his views are not hopeful. He says he has seen one case, which might be considered cured. It is that of an attorney at law who became paralytic and was first sent to a sanatorium and afterwards to an insane asylum, where the diagnosis was confirmed. To-day he is practising law again and is very busy and successful. In most of the cases, which are published as cured, they are back at the asylum again before the printer's ink, recording their cure, has become dry.

TRANSACTIONS OF FOREIGN SOCIETIES.

French.

DIAGNOSIS OF TYPHOID FEVER AND TYPHOID INFECTED WATER BY MEANS OF GELOSE—DANGERS OF CHLOROFORMISATION—PUBIC SUBLUXATION AND RUPTURE OF THE URETHRA—DIAGNOSIS OF GANGRENOUS APPENDICITIS—LIGATURE OF THE INFERIOR VENA CAVA WITH RECOVERY—HEMOLYTIC PROPERTIES OF HUMAN SERUM—NEPHROTOXINS—ACTION OF CONTINUOUS CURRENTS UPON THE SMALL INTESTINE—SUBLIMATE, AND FORMOL AS PARASITICIDES OF THE ECHINOCOCCUS—CORRECTION OF KERATOCONUS—VACCINATION AGAINST THE VARIOUS PASTEURELLOSES—COLOR REACTION OF THE BLOOD-CELLS IN DIABETES—OCULO-PUPILLARY SYNDROME IN TUBERCULOSIS OF THE APICES OF THE LUNGS.

THE French scientific societies during May and June were occupied with the consideration of various topics of practical importance, of which the following series have been chosen for the attention of our readers:

CHANTEMESSE at the Académie de Médecine May 20, 1902, read a paper on the diagnosis of typhoid fever and of typhoid infected waters by means of gelose, recalling the fact that in 1901 he had described a rapid method of research and diagnosis of the typhoid bacillus in suspected fluid and in the clothing of beds and patients, the essential elements of which are to obtain on carbolized gelatine superficial colonies, to cultivate them on a medium of lactose and litmus and to recognize them by their characteristic agglutination.

The three steps of this process he has simplified by combining the lactose and the litmus with the carbolic gelatine. The formula consists of adding to 10 c.c. of ordinary gelatine (peptonized water 3 per cent. strength to which 2 per cent. of gelatine has been added) .4 gelatine. The formula consists of adding to 10 cc. of lactose and 1.00 cc. of sensitive litmus tincture. The whole is then liquefied on a water-bath and poured upon Petri dishes in very thin films (not more than 1 to 2 millimeters in depth). Five or six dishes are then inoculated by stroking them with a very fine hog-bristle dipped once into a solution of the fecal dejections from the patient. After about twelve hours in the oven, the thin pink films will show numerous colonies, many of them red (bacillus coli communis) and others bluish (bacillus typhosus). The latter can be verified by the agglutination test. He has been able by this brief and simple procedure to recognize the bacillus wherever he has examined for them in the feces of typhoid patients. Moreover he maintains that he has found it a very easy and direct route to the clinical diagnosis of enteric fever. Suspected waters can be examined by causing a large quantity to pass through a good filter and then using the porcelain jar as the source of germs for the test.

HUCHARD referred to the paper of Laborde, read at the preceding meeting on the dangers of chloroform, especially the claim that combinations of morphine, sparteine and atropine are of service in making the anesthesia easier and safer. Atropine is the physiological antagonist of morphine, but it is by no means certain that it behaves in this manner therapeutically. Therefore it is well to bear these points in mind and to employ it with judgment and care.

MIGNON, at the Société de Chirurgie, May 14, 1902, read a paper on subluxation of the pubis and rupture of the membranous urethra. His patient was a cavalryman who had fallen with his horse and noted hematuria a short time afterward. Mignon made a diagnosis of urethral rupture secondary to a fracture of the pelvis and passed a retention catheter. The following day he observed an infiltration of the prevesical space and determined to explore for rupture of the bladder also. At this operation he found no lesion of the bladder, a pubic subluxation instead of a pelvic fracture and a complete laceration of the membranous urethra. He then carried out retrograde catheterism for drainage of the bladder, but made no attempt to suture the urethra because the inferior end was so much retracted. A perineal section was done to facilitate cleanliness of the wound. Recovery was finally complete, but several slight complications had to be overcome by various minor interventions.

WALTHER discussed a case bearing upon the importance and the difficulties of diagnosis of gangrenous appendicitis. The child showed only one distinct local symptom, namely, tenderness at McBurney's point. There were no signs of any exudate, yet at the operation an entirely gangrenous viscus was found. The patient died of sepsis shortly after. Unfortunately the present knowledge of the bacteriology of appendicitis will not permit of the definite estimate of the degree and virulence of this disease. In this patient the diagnosis was early and the operation promptly done, but the undetermined element of the potency of the bacterial infection destroyed life.

HOUZEL (Boulogne-sur-Mer) read notes on a case of ligature of the inferior vena cava followed by recovery. The woman was thirty-six years old, had undergone operation for a pyonephrosis which did not entirely relieve her from the cachexia secondary to the purulent process. A nephrectomy was then undertaken. The perinephritic adhesions were so numerous and so firm that the inferior vena cava was torn through for a distance of a centimeter or more. The rapid flow of blood and the feeble general condition of the patient made lateral suture of the wound impossible. Two circular ligatures were therefore passed about the vessel, one above and the other below the wound. The patient recovered promptly, suffered only from edema of the lower extremities for a while and one year after the operation was entirely well.

J. GAMUS and PAGNIEZ at the Société de Biologie, May 17, 1902, discussed the hemolytic action of human blood-serum upon the blood of rabbits, especially with reference to the relation of such effects to the degree and kind of leucocytosis present. They found that the number of white blood cells present bears a direct ratio to the activity of the hemolysis. In three instances, however, the phenomenon was absent, although polyneuclear

leucocytes were abundant. Mononuclear leucocytes were almost entirely absent or very feebly increased in number. They are, according to Metchnikoff, the source of macrocytosis. On the other hand in studying the effect of human blood serum in twenty-four cases upon normal human blood cells, the authors found thirteen examples of hemolysis due to it. This abnormal effect of the serum appeared due to no influence whatever of the white cells. Moreover this hemolysis which disappears at a temperature of 56° C. seems to depend entirely upon the occurrence or presence of an iso-sensibilisatrice. One may consequently conceive that in conditions which are accompanied by a destruction of blood cells like chlorosis, cancer, etc., there circulates through the organism a globulicide which is not retained in the liver or excreted by the kidneys.

CASTAIGNE and RATHERY have been investigating the matter of kidney toxins. They have been able to produce lesions of the convoluted tubules in the kidneys of rabbits, by injecting into them an emulsion of kidney substance or of nephrotoxins. The injection of the kidney substance of a guinea pig determines a very abundant albuminuria and then the death of the animal. Histologically there is a protoplasmic cytolysis of very delicate characters. The same phenomena follow, if one injects into a rabbit the emulsion of one of its own kidneys removed by nephrectomy, or the serum of another rabbit which has been poisoned by the same procedure of autonephrotoxin injection, and if injections into a guinea pig be done with the serum of a rabbit poisoned by emulsions of guinea-pig kidney-substance. The symptoms caused are a progressive emaciation, albuminuria, and finally death.

LAQUERRIÈRE and DELHERM have been studying the effects of the continuous currents upon the small intestine independently of the points to which the electrodes are applied. Immediately after opening the abdomen one sees a great activity of the small bowel, but it is impossible to state whether this is due to an electrization of the smooth muscle fibers which may be in the direct circuit, or to the reflex nervous action. When the intestine does not show any spontaneous activity, continuous currents, whether the gut is inter- or extrapolar, do not appear to excite any other than feeble contractions. If the intestines are agglutinated, strictures and local spasms will appear. If the coils are in contact one coil acts as an electrode to the others. With currents of greater intensity than 20 milliampères movements occur which do not depend at all upon the sites at which the electrodes are placed, but they are not all as distinct as those under faradisation. Finally it appears that galvanism is without much effect upon the longitudinal muscle-bundles.

DÉVÉ communicated the results of experiments on the parasiticide action of sublimate and formol on the echinococcus. He found that $^1/_{1000}$ solutions of the sublimate and $^5/_{1000}$ solutions of formol will destroy the germ in two or three minutes. This fact has the practical application that secondary infections with the echinococcus can be avoided by aspirating the large cysts, then injecting them with either of these germicides and finally evacuating and ablating them after the injection has been in them five minutes.

J. JANSSEN at the Académie des Sciences, May 20, 1902, read a contribution discussing the various visual conditions which are susceptible of treatment in keratoconus. The cornea in keratoconus may be considered a normal cornea upon whose normal spherical curve there has been added a segment of a sphere whose posterior surface is opposed to the curve of the cornea and whose anterior surface is so curved as to make a true cone with its apex spherically rounded off or forming a parabola. Hence in order to correct the secondary visual errors it is only necessary to place before the eye a glass which will totally compensate for the error of this imaginary superimposed spheroid. Theoretically it is necessary to use a circular lens whose posterior surface is a spherical surface of the same radius of curvature as the normal cornea and whose anterior surface is of the same radius of curvature as that of the superimposed segment of a sphere. Practically, however, it is simpler and equally efficacious to use lenses concave on the front and convex on the back, but both truly spherical surfaces.

J. and M. LIGNIÈRES read notes on the efficacy of vaccination as a means of imposing complete or partial immunity against the group of diseases among animals conveniently distinguished as pasteurelloses and comprising a large numer of hemorrhagic septicemias: typhoid fever in horses, and young dogs, hen-cholera, hemorrhagic septicemia in sheep, kine and swine, etc. The method of preparing this vaccine consists in attenuating the virulence of the germ and making it vegetate on gelatin-agar for one year with reinoculations every two days, then transplanting it upon peptonized bouillon which is raised for two or three days to a temperature of 42° to 43° C. The most important point is that of selecting the vaccine. Is it necessary to produce a virus for each form of pasteurella, or is it possible to produce a polyvalent virus? It was to this second problem that the two doctors directed their attention and produced a virus made up of those of six different forms of pasteurella, namely, of those of sheep, kine, dogs, horses, hogs and poultry. This virus must be injected in doses ranging from 0.125 to 1 cc. according to the weight of the animal. The immunity which it confers lasts about a year.

J. LE GOFF has ascertained that the blood-cells of diabetic patients possess the quality of staining with basic aniline dyes, while those of normal subjects have a predilection for the acid colors. He has recently been interested in explaining this phenomenon. For this purpose, after studying the chromatic features of pure hemoglobin and of that various combined with hydrates of carbon, he made up a hyperglycerinic blood by adding glucose to a normal physiological serum. In this manner he was able to change the characters of the blood-cells so that they would take basic rather than acid dyes precisely like the blood of diabetic patients. It seems, therefore, permissible to assume that in diabetes there exists some kind of combination between the hemoglobin and the glucose.

SOUQUES, at the Société des Hôpitaux, May 23, 1902, read notes of his observations upon three patients who had pulmonary apical tuberculosis and presented an oculo-pupillary syndrome consisting of myosis, decrease of the palpebral fissure and a diminution and retraction of the globe of the eyeball. No focal cause of these phenomena could be elicited and the author is of the opinion that there is a relation of cause and effect between the apical tuberculosis and the eye signs. These latter are due to a destruction of the irido-dilator fibers of the sympathetic nerve or of the fibers of communication between this and the first dorsal nerve, which pass directly in contact with the cul-de-sac of the apical pleura and would be readily involved and destroyed by the pachypleuritis which is inevitably present in tuberculosis of the apices. Such nervous lesions might cause this cycle of oculo-pupillary symptoms.

Appointment of Oculists in Public Schools.—Superintendent Maxwell is inclined to consider Commissioner Lederle's statistics regarding contagious eye diseases overdrawn and is opposed to the appointment of consulting ophthalmologists.

SPECIAL ARTICLE.

THE DYNAMICS OF LIVING MATTER.

The General Chemical Character of Life Phenomena.—On March 18, 1902, at Columbia University, Dr. Jacques Loeb of the University of Chicago delivered a lecture with the above title as the first of a series on The Dynamics of Living Matter. He stated that his intention was to present a number of facts which may enable us to exercise a certain amount of control over life phenomena. The reason why the latter can not be initiated in the chemical laboratory is because chemists have hitherto employed only processes involving high temperatures, strong acids, etc. We now use appliances the worth of which chemists are just beginning to realize, namely, catalytic agents which, without participating in the chemical reaction, give rise to it. These agents work at the low temperature of the body, and are in some cases enzymes which can be extracted from the body-cells by water, showing that the catalytic power is not connected with the inherited side of living matter, which latter is closely bound up in the structure of the cells. One characteristic of a higher intelligence is that cells store up nourishment in times of abundance. How can forces accomplish such a result? The solution of this problem is not idealistic but physicochemical. Two years ago it was discovered that enzymes have a reversible action; cells take and store up fat, which, during periods of malnutrition, is drawn upon by the body, the absorption being brought about by the enzyme lipase, which can split up fat. Lipase is able to bring about a synthesis of fats. When lipase is added to fat in the intestine, the fat is split up, but its digestion is not finished. It is absorbed by the cells and here the lipase causes a synthesis of the two elements, bringing about a chemical equilibrium between the alcohol and the butyric acid. In time of want the lipase in the cells breaks up the fat. Castle and Loevenhart found that all cells contain lipase, and it is this which compels them to act with apparent intelligence. The disunited elements of fat must diffuse from the blood or lymph into the cells, in which they cannot exist as butyric acid and alcohol, but must be synthesized into fat. Lipase accelerates this action. It is said that the animal instinct of storing food in summer is analogous to this action in the cells, but the analogy is a dangerous one.

How are the physiological oxidations at low temperature brought about? The answer is, by the specific catalytic agencies in cells. It seems very probable that these catalytic substances are peroxides, capable of taking up and binding oxygen, which also they are capable of easily giving off. Schmiedeberg found that these oxidations are purely physicochemical phenomena in no way connected with the structure of cells. The watery extract of cells is capable of bringing about the same oxidations as the cells themselves. These catalytic agents are known as oxidases. They are not true proteids, but nucleoproteids; they are contained in the nuclei of the ceils, which proves that the nuclei are the main respiratory organs of living matter. Recently it has been found that the oxidases are most energetic at the periphery of the nucleus. There is one type of cells without nuclei, red blood-cells; but these contain substances resembling nucleoproteids, which proves the rule. Hemoglobin is able to combine and give up oxygen. Green cells contain chlorophyll, a similar substance. Analogous processes involving the action of oxidases are to be found in the formation of pigment in the wings of butterflies, and in malignant tumors. The formation of black pigment is due to an oxidase, known as tyrosinase. In the intestine the enzyme trypsin forms amido-acids, of which tyrosin is one, and hexose bases. In the cells the same action takes place. When the cells are starved, a process of self-digestion takes place, under the influence of trypsin, and one of the products formed is tyrosin. Tyrosinase completes this action with the formation of black pigment.

There are questions suggested by other chemicophysical phenomena, as, What rôle does oxygen play in our life history? Without oxygen we die quickly; although in the lower animals the heart may keep on beating for a long time after the death of the animal, in human beings the heart stops beating almost instantly. The ordinary explanation would be that oxygen is necessary to supply energy to the heart. Fries found this insufficient, for oxygen plays an altogether different biological rôle. In experiments he found that in the absence of oxygen the heart of *Fantulus* beats for many hours, but that of *Penolampus* stops in a few minutes. When this experiment is performed in the two- and four-celled stages of germ life, in the absence of oxygen the germ of *Penolampus* is reduced to a homogeneous mass, while that of *Fantulus* is not changed. Thus the absence of oxygen kills, not because it fails to provide energy, but because the machine itself is annihilated. This was confirmed by Pasteur. The catalytic agencies in cells vary easily on account of outside influences. If the production of chemical energy be the ultimate end, why are vital phenomena not uniform? The number of enzymes is limited, but their action is extremely sensitive to outside conditions which vary their effectiveness. Pasteur found that when we add yeast to sugar solution, in the absence of oxygen we get powerful fermentation. In the presence of oxygen fermentation is extremely limited. The transformation of sugar is due to a specific enzyme, zymase, acting best in the absence of oxygen; with oxygen the zymase forms, not alcohol and carbon dioxide, but other substances, such as cellulose. Pasteur showed two types of life phenomena, one with oxygen and one without it. Zymase has been discovered in plant cells. In muscle a similar fermentative process takes place. When muscles work in the absence of oxygen, there are formed sugar and lactic acid and alcohol. In the presence of oxygen there are formed no lactic acid or sugar, but enormous growth occurs.

These facts are important in the field of immunity, according to Pasteur. The blood of a rabbit injected into a guinea-pig does not at first affect the blood-corpuscles; if the injection be continued, the red blood-cells of the guinea-pig will be killed through enzymes in the blood of the rabbit; at first these could not act, but repeated injection induced a condition whereby they became active. Thus the action of enzymes may be varied by outside conditions. Enzymes which do not exist normally may be created. There are critical points in the development of the organism, when one enzyme is made active and another inactive. Since activity and inactivity of enzymes depend on outside circumstances, it may be possible to exercise a certain amount of control over life phenomena. We need not despair of ultimate physicochemical analysis of living phenomena. The term catalytic agent covers much; there is no reason why we should call hydrogen peroxide an enzyme. There are catalytic agents which have to do only with the physical structure of cells, being concerned with colloidal substances, water in which minute particles of matter are held in suspension.

The General Physical Constitution of Living Matter.—To accomplish some control over enzymes, to learn how to handle them and introduce them into cells, to

check the action of some and to favor the action of others, two ways are open, *viz*, physicochemical analysis and imitation of Nature's process. The former method was first investigated by Pasteur, who described the connection between the chemical configuration of molecules and the action of ferments; he discovered that the ease with which left-handed tartaric acid undergoes fermentation is attributable to the geometrical shape of its molecule. This conception of stereochemistry was taken up by Emil Fisher, who found that differences in the fermentation of various sugars is dependent upon the chemical configuration of molecules, and that all proteids have a nucleus of carbohydrates endowed with a definite geometrical shape. Fermentation is possible only when the ferment molecule fits exactly into the fermentable molecule. Possibly this generalization is very limited, because the polysaccharides, which seem fermentable, cannot be fermented by zymase without first experiencing the action of another ferment; thus too much cannot be founded on stereochemistry in elucidating the enzymotic processes of life. In the effort to imitate Nature's processes, according to the former method, many facts have been discovered. Pavy found that the process which is typical of life phenomena, viz., the transformation of alcohol into acetic acid, can be accomplished by finely-divided platinum. The bacteria of putrefaction can transform calcium formate into calcium carbonate and hydrogen; this change can also be accomplished by platinum in fine division, which has even the same power as lipase—that of splitting fats. The action of both lipase and platinum can be annihilated by potassium cyanide. One may thus imitate the most secret life phenomena at the temperature of the body, without the use of acid or alkali.

It has long been observed in cases of poisoning by potassium cyanide that the blood in the veins is perfectly arterial, although the proximate cause of death is suffocation. This is because the cyanide prevents the tissues from taking up oxygen. Living matter and finely-divided platina are both colloidal solutions. Part of our living matter must be liquid and subject to the same forces that are at work in maintaining platinum in a state of fine suspension. These forces are electrical charges carried by the particles, which all have the same charge and hence repel each other so they are not thrown down. When the charges are removed the particles remain no longer in solution, but are coagulated.

According to the recent theory of Aurelius, electrolytes such as sodium, potassium, etc., when in watery solution, exist not in their molecular form, but as particles bearing positive and negative charges. The electrolytes also have the power in certain cases of transforming hydrosols into hydrogels, and the coagulating effect of electrolytes increases with the valency or electrical charge of the anion. Pavy observed that white of egg acts as do solutions of the metals; if a trace of acid be added, the white of egg travels to the positive pole, where it gives up its negative charges and is precipitated; if an alkali be added precipitation occurs at the negative pole. Since life depends on the maintenance of the liquid condition of protoplasm, everything that coagulates protoplasm brings life to an end. The chief forces that maintain this liquid condition are electrical charges; but all life's phenomena cannot be explained from the standpoint of electricity. Heat also plays an important rôle. Moreover, part of protoplasm is solid. The remainder is in colloidal or in true solution. Nucleohiston, which is in true solution, may be ionized and behaves in the same manner as do colloidal solutions. In coagulation a definite structure occurs which varies with the nature of the substance, with the agent causing coagulation, and with the tension. As far as the dynamics of living substance are concerned, attention should be paid exclusively to the liquid part of protoplasm, to the so-called hydrosols.

Protoplasmic Motion, Muscular Contraction and Cell Division.—The first attempt to give a clear idea of how heat can bring about muscular contraction was made by Engelman in the theory that the essential parts of the muscle are solids, in direct contradiction to results recently obtained—living matter must remain liquid. Observation on striped muscle shows the presence of anisotropic substance, *i.e.*, that with double refraction. Engelman experimented on violin-string, which is such a substance, and found that, when it is suspended in water with a weight attached to its lower end and with a platinum coil wound around it, the elevation of the temperature of the water by means of the platinum coil causes the string to imbibe water and to become shorter and broader, analogous to changes in the anisotropic substance in muscle, caused by elevations of temperature at certain points in the muscle and the imbibition of water. The assumption, however, that at certain points in the muscle the temperature undergoes elevation is untenable, because it is impossible to assume that in frequently contracting muscles (one-hundred times per second, as in the wings of insects) the anisotropic substance gets heated and cooled off with equal rapidity. Engelman saw that it would be necessary to apply his theory to the motions of ameba, that the sending out of pseudopodia would have to be attributed to rises of temperature and to imbibition of water. This application was supported by the discovery in ameba of traces of doubly-refracting substance. There was the difficulty of the streaming of protoplasm in the pseudopodia as incompatible with the structure necessary for the manifestation of life, the liquid condition. Hartman assumed that the very streaming of the protoplasm explains the phenomenon of double refraction, for Mach had shown that the latter can be produced in liquids of a high degree of viscosity under stress which would be furnished by the two opposing currents in highly viscid protoplasm. Many other attempts have been made by other physiologists to explain the contraction of muscle on the basis of other forces characteristic of liquids.

As one of these theories has shown how increase in surface tension causes contraction of muscle, it now remains to show how chemical energy is transformed into surface energy. This may be direct, the stimulus giving rise to chemical changes with the production of substances which would in some way cause increase in surface tension; or the transformation may be indirect, chemical changes giving rise to electrical ones and the latter resulting in increase of surface tension. The latter theory was first advanced by Lipman, who realized that stimulation of a muscle by a nerve may be electrical in character. The chemical processes in the muscle would result in the production of electrically charged ions; lactic acid is produced and probably other ions are formed. D'Arsonval realized that perhaps the negative variation had something to do with the increase of surface tension. If two liquids, such as mercury and a mixture of sulphuric acid and water, be placed in contact in a jar, the ions of the former will have a negative charge and those of the latter will have a positive charge. The fact that the particles at the surface of the mercury all have a negative charge would make them all repel one another. Surface tension is due to the opposite, the contraction of the particles on the surface. If the charges in the surface particles be removed, the particles approach one another and the surface tension becomes

maximum. What is the cause of ameboid movements? Direct observation shows a streaming of liquids. Engelman admitted that the streaming is a transitory phenomenon. The rotation of protoplasm can be seen in plant cells. Quinque tried to explain ameboid movement by means of the following experiment: If a drop of oil be placed on the surface of water exposed to air, it is subjected to the action of three kinds of surface tension, namely, that between the oil and water, that between the oil and air, and that between the water and air. The drop of oil will be pushed along in the direction of greatest surface tension, that between the water and air. The adjacent particles of water are carried along with it. Quinque assumed that the same process occurs in cells. He took oil, soap solution and protoplasm; the surface tension is greatest between the protoplasm and oil. The oil is present in all cells and so are fatty acids, which in the presence of alkalies form soaps. The soap dissolves and spreads out, taking the neighboring protoplasm with it. The taking up of food is an application of the laws of surface tension. Wilson has shown that the directive forces of cell division are those of liquids. It appears that the spindle occupies the long axis of the protoplasmic mass, which is the position of equilibrium of the streaming masses.

The Effects of Ions upon Various Life Phenomena.—In considering how best to control life phenomena, the easiest way seems to introduce enzymes into the cells. This is not practicable because enzymes, having the character of colloidal solutions, share the property of the latter in being unable to permeate animal membranes. All attempts to bring about fertilization of eggs by enzymes have failed. We can, however, introduce into the cells substances that can control the action of the enzymes. Some enzymes act better in the presence of hydrogen ions. Hydrocyanic acid retards the action of many. The addition of a slight amount of acid to seawater retards the development of eggs; some hydroxyl ions favor their development.

The second group of chemical phenomena showing the control of life processes includes narcotics. Narcotics belong to the fatty-acid series, the aromatic series, and the alkaloids. They are all soluble in fat. All cells contain the fats lecithin and cholesterin as regular constituents. Hansmeyer found that the narcotic power of a substance contained in one of these categories is parallel with the degree of its solubility in fat. All narcotics are soluble in water as well; but there is no relationship between this solubility and their narcotic power.

The greatest narcotic effect is produced in tissues containing the greatest amount of lecithin and cholesterin, *viz.*, in the ganglion cells of the central nervous system. One can only conclude that the action of narcotics is a physical phenomenon.

These facts are certainly of morphological and pathological importance. The same narcotic that paralyzes protoplasmic motion does more if applied in greater concentration; it destroys or liquefies the cells. This is the case with red blood-cells. The interest connected with this makes it apparent that those constituents that determine the form of cells are built up to a great extent of lipoids. This is suggestive pathologically, for it directs our attention to all those substances besides narcotics that dissolve cells to determine whether these act on the lipoids.

Can we hope by narcotics to control life phenomena? This is to a degree possible. There are two stages in the action of narcotics: to a slight degree they may modify lipoids and favor activity; to a greater degree they go further, modify the lipoids in a different way and destroy activity. The group of compounds that act more powerfully than these are the electrolytes, which share with the narcotics the power of penetrating into cells. There is one fundamental fact concerning the electrolytes which appears from experiments, *viz.*, wherever we have one kind in solution, it leads to suspension of life; if we add another, it leads to prolongation of life. Osmosis would appear to modify the effects of the electrolytes. There are, however, a number of organisms which, within wide limits, do not depend on the osmotic pressure of the fluids in which they are immersed. "Paramecium" is one of these. The eggs of *Fantulus*, a marine fish, contain sodium chloride, but they develop just as well in distilled water as in sea-water. At first sight it would appear that the eggs of *Fantulus* in distilled water would absorb large quantities of water, which they do not. This would lead us to suppose that the membrane of *Fantulus* is impermeable, which is wrong, for the same eggs are exeremely sensitive to the constitution of the sea-water. The reason why they do not lose all the salts they contain in distilled water is because salts and ions may diffuse into them, yet cannot diffuse out of their protoplasm. A similar phenomenon is observed in muscles, which contain an enormous amount of potassium; in solution this would kill, as potassium ions are extremely poisonous; it must then be in another form. When a muscle dies the potassium diffuses out; when the muscle lives it does not.

When we put eggs of *Fantulus* immediately after fertilization into a 5/6-normal-salt solution they cannot form embryos. If we add a trace of calcium chloride all the eggs form embryos. We might conclude that calcium is a necessary stimulus of fertilization, that it starts the phenomena of fertilization. This is not the case, for the same eggs develop in distilled water. We can really say that sodium chloride in the same concentration as it exists in sea-water so alters the constitution of cells as to interfere with the production of energy, thus preventing the manifestations of life. A small amount of calcium acts anitoxically on the sodium chloride. Other metals share the same power with calcium, as all are bivalent. From these facts one may generalize that bivalent cations in small doses counteract the effect of sodium chloride. If we take trivalent ions, they, too, act antitoxically, but a still smaller proportion of these is necessary to bring about antitoxic effects. In the case of all salts, such as the citrates, oxalates, etc., in which anions have a higher valency, no effect is observed. We are led to understand that a solution to which an animal is adapted can become poisonous if the balance of its constituents be disturbed. Sea-water is the natural habitat for certain organisms. Our blood is a physically balanced solution for our red blood-cells. When we eliminate from sea-water its calcium, we destroy the balance, and the water becomes toxic.

If this conception be correct, it must be of importance in the case of the phenomena of the central nervous system. It is a fact that a disturbance in the proportion of ions produces phenomena of irritability not observed in normal tissue. By means of certain electrolytes the equilibrium of the constituents of muscle is destroyed and its irritability is changed. The same occurs with muscle as with the eggs of marine fauna; if a muscle is put into a 1/8-normal-salt solution, it dies quickly; but if a trace of calcium or zinc be added, its life is prolonged. Muscle is a good representative of living matter, as its surrounding fluids must have a certain balance for the preservation of normal irritability. If we put a muscle into a solution which precipitates calcium, the muscle will remain quiet. Take the muscle out of the solution and it displays a phenomenon that is never seen in normal muscle, powerful contraction.

The nature of this change is that when the muscle has been immersed in any one of these solutions, the slightest change in contact is capable of producing loss of equilibrium, with a consequent change in the irritability of the muscle. Substances that ordinarily have no effect on a muscle have an effect when the equilibrium of the muscle is slightly disturbed.

The points of attack in attempts at the prolongation of life are the heart-beat and the respiration. Ostwald has pointed out that from the very character of life phenomena it is necessary for a certain equilibrium to be present, requiring a regulatory mechanism. Life is possible only in the presence of the regulatory mechanism, the function of which is to prevent excess, as well as to promote activity in protoplasm. This regulation must lead to rhythmical phenomena. When the heart-muscle contracts, the inhibitory mechanism is aroused; the continuance of this causes the heart to stop; then the excitatory activity gains the upper hand and the heart contracts again. In the case of native striated muscle, under normal conditions it is at rest only when the solutions of electrolytes are normally balanced. If the equilibrium of the electrolytes be destroyed, the muscle will contract rhythmically. An example of this is the jellyfish, which, deprived of its central nervous system, will not contract, but if put into sea-water will beat rhythmically.

The Effect of Temperature on Life Phenomena.—At 40 to 50° C. almost all life ceases on account of the clumping of the colloidal particles. A few organisms can live at a higher temperature, as certain algæ in hot springs exist at a temperature of 60 to 70° C. It would be an interesting line of research to discover if these organisms contain protoplasm, the coagulation temperature of which is higher; a second line to ascertain if those organisms that die at a comparatively low temperature can be acclimated to a higher; if this be true, it should be of importance in medicine in the field of immunity. The intensity or velocity of life processes increases with the rise in temperature up to a certain point, above which the effect is to cause a decrease in the velocity of life phenomena. In some cases in the lower organisms the decrease of temperature causes an increase in the velocity of life processes. The metamorphosis of butterflies is increased when the chrysalis is exposed to cold. The lowering of temperature increases the irritability of frogs. A certain equilibrium is necessary for life phenomena, in the case of temperature as well as in the case of the electrolytes. If the temperature be suddenly lowered, the action of all the enzymes is influenced, but in a varying degree; the enzymes are inhibited unequally, their balance is disturbed and some of them are enabled to work without hindrance.

The Effects of the Galvanic Current upon Life Phenomena.—Animals have no sense-organ to perceive electrical changes in the environment. Galvanism is the most universal, convenient and familiar form of stimulation. In our body the current can be conducted only by the liquids, and is carried either by the ions or by the colloidal particles in solution. These particles have definite charges, and the alterations of life phenomena are attributable to various influences affecting the migration of the ions, the loss of their charges at one pole and chemical changes which they undergo. When the particles lose their charges coagulation occurs. What is the origin of these electrical charges? It has recently been discovered in Ostwald's laboratory that if a powdered substance be placed on a disk of platinum and then blown off, an electrical charge remains on the surface of the platinum. This charge varies with the character of the substance used. Dry acids impart a positive charge and the hydroxyls a negative charge. Salts give no charge. A film of liquid is formed between the powder and the platinum disk; in this liquid there occurs a solution of the electrolytes. If one of the ions has a greater velocity than another, it settles first on the platinum and charges it accordingly with its own kind of electricity. It seems as if the charges of the colloid particles are due to the same causes. Bradish says that the particles that go to the anode carry negative charges. If a metal such as gold be placed in water, a small amount of the gold goes into solution, not in the form of metallic gold, but in the form of ionic gold. It may be assumed that the particles of gold combine with positive electrons, and leave on the non-dissolved gold an equal amount of negative ions. All the effects are due to electrolytes in solution. The phenomena of anelectrotonus and cathelectrotonus are brought about by the migration of the ions. When a galvanic current is applied to a muscle or to a nerve, the migration of the cations of sodium, potassium, calcium, magnesium and histon occurs in the direction of the negative pole where they gather. The effect of the current is to deprive these ions of their electrical charges, and they become atoms, which become hydrates, causing chemical changes in the nerve and resulting in increase in irritability. The ions cause chemical changes with the production of acid and the decrease of irritability at the positive pole. To sum up, the effects of the galvanic current are due to the gathering of ions, probably of colloidal particles, at one pole. The effects of electrical waves on living matter are not due to the oscillatory character of the electricity, but to the contact effects of the current. Electrical waves have no physiological effect. We are shielded against them by the bodily liquids and the integuments. It would be well to warn physicians against the so-called cures produced by electric waves. How does electricity kill? It was observed by Hermann that when a current is sent through the blood the red blood-corpuscles are all dissolved in the course of time; this is a true heat effect. A slight rise of temperature can liquefy lipoids. In death by lightning heat plays a rôle, for lightning causes a liquefaction of the lipoids in the ganglion cells. Electricity, while it is the most universal stimulus, is also the least effective. Biologists and physicians may expect little for the near future, at least as far as the therapeutic effects of electricity are concerned.

The Effects of Light and Heliotropism.—The ether waves are liable to produce maximum effects when the body they meet acts as a resonator. The smaller light rays may be expected to affect or set up sympathetic motions in bodies which act as resonators. The colloidal particles of protoplasm may act as these resonators. Concentrated blue and violet light, which consists of waves of higher refraction, has been used to destroy tumors. The question is, How can these light waves act? There is no cell which at some period of its activity is not sensitive to light. The biological effects of light are familiarly observed in plants and in the lower organisms. The hydroid "eudendrium" when put into an aquarium suffers the loss of its polyps; these afterward regenerate, and regeneration is a function of the amount of light; in the dark the polyps do not regenerate. The effect on the polyps is produced chiefly by blue and violet light; behind red glass the polyps do not regenerate. It is through the agency of pigment cells that radiant energy is transformed into other kinds of energy, which process is a sort of natural color photography. Light can act only when it is absorbed. In a field of light waves the streams of energy travel along straight lines. The majority of organisms have symmetrical parts; hence points that

are symmetrical with respect to the rays of light are similarly affected by the latter. What happens when light strikes an organism on only one side? In the case of plants the stem turns toward the light; and in a section of the stem the protoplasm is denser on the side of the light. In the roots of plants the opposite condition is found. What does this difference in density signify? Can the bending of the protoplasmic structure toward the light be associated with its greater viscidity? Probably, for it is an interesting fact that in the same organ or plant there are two different kinds of protoplasm, one that becomes more dense and one that becomes less dense under appropriate stimulation by light.

SOCIETY PROCEEDINGS.

BRITISH MEDICAL ASSOCIATION.

Seventieth Annual Meeting, Held at Manchester, July 29, 30, 31, Aug. 1, 1902.

President's Address.—Dr. Walter Whitehead opened the meeting and spoke of Manchester's early influence on the advancement of medicine and of medical education. He said: My first duty is to thank my fellow members of the British Medical Association who have chosen me to fill the honorable office of President, and have thus afforded me the opportunity of welcoming them to the city of Manchester at this, the seventieth annual meeting of the Association, the largest voluntary medical society in the world. In extending to all our visitors a hearty welcome, I speak not only in the name of the members of the association resident in Manchester and the district around, but also of the citizens of Manchester, who are represented here to-night by their chief magistrate, the Right Honorable the Lord Mayor, and who join with us in hoping that your visit to our city may be both useful and pleasant.

The Last Meeting of the British Medical Association at Manchester.—When the British Medical Association last held its annual meeting in Manchester, just twenty-five years ago, the medical school had only recently been amalgamated with the Owens College, of which it has ever since been one of the most important departments. The college, which celebrated its jubilee a few years ago, owes its success as much to the breadth of view and wise foresight of its founder as to his noble generosity. This day, July 29th, is the fifty-sixth anniversary of the death of John Owens, and I ask you to join with me in praising the memory of one who was among the first in this country to show an appreciation of the fact, now so widely recognized, that the prosperity of a community, as of a nation, must have for one of its foundation stones a true respect for learning and intellectual inquiry, and an ardent desire to place the advantages of education within the reach of all who are capable of profiting by them.

Dr. Whitehead then referred to those who had died since that meeting, speaking of Dr. Eason Wilkinson, Sir William Roberts, Edward Lund, S. M. Bradley, Leech, John Thorburn and others.

The Annual Meeting, 1902.—In mapping out the scientific work of the meeting, which begins to-day, we have found it necessary to arrange for a very large number of sections. This has appeared advisable, partly because we hope that this meeting may prove a record in point of numbers, and partly because our study is one of growing complexity. Moreover, Manchester is the centre of probably the largest manufacturing district in the world, and the occasion has been taken to establish a special section for the discussion of subjects relating to industrial hygiene and diseases of occupation. Not only so, but, by the kindness of many of the leaders of industry in the district, opportunities will be afforded to those who may wish to do so, to inspect many of our most important manufactories, to note the conditions under which the work is carried on, and to observe the means which have been devised to guard against accident and to protect the work people from injury to health. Manchester physicians and manufacturers were, as I shall have occasion to show, among the pioneers of this department of preventive medicine, if I may so style it, and I do not think that they are lagging behind now. The arrangements which have been made by the presidents and officers of the other sections show that many opportunities will be afforded for the discussion of those subjects in all departments of the science and art of medicine which are most interesting to us at the present day. I hope that much of permanent benefit will flow from these debates, for, as the late Sir William Jenner, in his address as President of the Section of Medicine at the last meeting of the Association in Manchester, said with great force and truth: "The circulation of ideas is as necessary for intellectual and scientific life and growth as is the circulation of blood for physical life and growth. The ideas of others is the seed for new ideas in ourselves—we give, we receive, and new ideas are begotten; a third, differing from its parents, is the outcome of the two. The new ideas thus created open out wider fields for research and fresh methods of testing the value of the produce of research. As men talk one with another, new modes are discovered of looking at old things—prejudices fade away—identity of fact and meaning are found to underlie differences in words; and, by comparing their own observations and their own conclusions with those of others, they correct the former and rectify the latter."

Charles White and the Royal Infirmary.—Of the institutions for the benefit of the people which came into being at this epoch, let me speak first of the Royal Infirmary, on account not only of its intrinsic importance—it was at once a general hospital, an isolation hospital for infectious diseases, and a hospital for lunatics—but also because it played, indirectly, a great part in the intellectual activity of the city. Moreover, it is probably the oldest of our public institutions, for it had its first beginning just a century and a half ago, when Charles White, with the financial assistance of Joseph Bancroft, a man "conspicuous for his public and private charities," hired and fitted up a small house in Garden Street, off Shude Hill, now a wilderness of warehouses. It would seem that it only required the stimulus supplied by Charles White's enthusiasm to convince the leading inhabitants of the then small but growing town of the need of a hospital, for within a couple of months of this modest beginning a conference was held and a committee appointed to collect money. Their first step was to purchase from Sir Oswald Mosley, the lord of the manor, the "Daub Hole Field," a site of a little over an acre, and it is on this field and some adjoining land acquired subsequently that the infirmary still stands. A west wing forming the first part of the infirmary buildings was taken into use in 1755, and provided beds for forty patients. Ten years later a wing was added for the reception of patients suffering from mental diseases. At that time only three such institutions existed in the country, the hospitals of Bethlehem and St. Luke in London, and the institution at Newcastle-on-Tyne. The patients in the lunacy block of the infirmary were placed under the supervision of the physicians to the infirmary, and this arrangement continued until 1847, when, partly to provide more beds for the infirmary proper, and partly because the building was found to be out of date, the mental cases were

removed to the Manchester Royal Lunatic Hospital at Cheadle, now under the able direction of Dr. Mould, the lecturer on mental diseases in the Owens College. In 1796, another addition was made to the infirmary by the erection of a separate building in the infirmary grounds to receive patients suffering from infectious fevers; this also was officered by the physicians to the infirmary, but as I shall have to refer to it again it will suffice to say that the arrangement continued until 1870, when a special infectious disease hospital was erected at Monsall. For a time the city authorities defrayed the cost of patients for whom they were responsible, but eventually purchased the hospital, which now provides, in detached blocks, accommodation for 400 patients, who are under the charge of the medical officer of health and his colleagues. As a consequence of these and other changes the accommodation provided by the infirmary proper was steadily increased, until it now contains beds for 292 patients, while its capacity is indirectly increased by the convalescent home at Cheadle, which accommodates 136 convalescents, and by further provision for the reception of such patients in institutions at Southport and Buxton.

From its earliest days the infirmary has rendered great services to Manchester and the surrounding district, and to the progress of medical and surgical science.

Mr. Crossley's Gift to the Manchester and Salford Hospital for Consumption.—If I may be allowed to include Salford and Ancoats as parts of greater Manchester, then I must add a few words as to the two other general hospitals, the Salford Royal Hospital and the Ancoats Hospital. The first had its origin in 1827, and the corner stone of a portion of the present building was laid in 1830, though it was not until 1845 that 10 beds were provided for in-patients. It was gradually enlarged until it contained 62 beds in 1882, in which year the late Mr. John Pendlebury bequeathed a sum of money which enabled the governors to increase the number of beds to 127. The Ancoats Hospital grew out of a dispensary for out and home patients founded in 1828 in the interests of the working classes then becoming concentrated in the district, and with the view of relieving the pressure upon the infirmary. A large part in this movement was taken by the late Sir James Kay-Shuttleworth. He had settled in Manchester as a physician in 1827, and early turned his attention to public health questions, though he found time to publish in 1834 a treatise on the physiology, pathology, and treatment of asphyxia, which won for him the Fothergillian medal of the Royal Humane Society. The Ardwick and Ancoats Dispensary grew into a general hospital, the first stone of which was laid in 1871. A new pavilion, the gift of Mr. James Jardine, raising the number of beds to 114, was opened in 1888, by the then Prince of Wales, now King Edward VII, whose rapid recovery from a serious illness under the skilful treatment of my friend, Sir Frederick Treves, may justly be reckoned among the triumphs of modern surgery.

Thanks to the epoch-making discovery of Koch, we now know that consumption is a preventable disease; subsequent investigations of this master of experimental pathology, and of many other skilful workers, among whom I would mention as one of the most original and successful, Dr. Sheridan Delépine, Procter Professor of Pathology in this College, have placed us in possession of facts which show us the nature of the methods by which the scourge may be diminished, and perchance in time extinguished. Chief among these is the prevention of the infection of healthy persons. The open-air treatment of consumption takes the sufferer in the early stage of his illness, places him under conditions of life which have been proved to favor his cure, and thus gratifies the generous pity which impels us to help the sufferer, and enables us at the same time to fulfil the duty which we owe to the community to prevent others from contracting the disease. In order to place this system of treatment within reach of the poorer citizens of Manchester and Salford, Mr. Crossley is building, on a site comprising sixty-six acres at Birch Hill, in Delamere Forest, 420 feet above sea level, a sanatorium where eighty sufferers from consumption will find every means for their recovery which experience can devise or generosity provide. The erection and equipment of the sanatorium will cost the donor some £70,000. The best way in which the people of Manchester can show their gratitude to him is to respond freely to the appeal which the Lord Mayor has made for subscriptions to a fund for the endowment of the institution which Mr. Crossley's public-spirited munificence has provided.

Manchester Medical Schools.—In Manchester, as in other communities full of active life, the development of the medical school was not along one continuous path. The work of many men, sometimes along paths apparently divergent, was necessary; but, as in every process of organic evolution, there were times of rapid accretion with succeeding periods of absorption, leaving an organism fit for steady and sturdy growth. Amidst all the struggles and rivalries, which extended over nearly half a century, there was evolved a school of which Manchester may well be proud, and the true value of which to the community will rise as the union between the college on the one hand and the infirmary on the other becomes more intimate. So far as medical education is concerned, these two institutions must be regarded as one, with common interests and joint duties towards the community in and for which they work; for of the science and art of medicine it may truly be said that it is nothing if not practical, and that in all his active work the practitioner of the art must be guided by a kind of sublimated common-sense.

We owe, I believe, the first beginnings of a medical school in Manchester to Charles White, the founder of the infirmary, for in 1786, assisted by his son, he began a course of lectures on anatomy and physiology, while Thomas Henry gave a course of lectures on chemistry concurrently. Henry, who had become a visiting apothecary to the infirmary in 1778, was one of the founders of the chemical industry in this district. The son of an Antrim man, who had settled as a schoolmaster at Wrexham, he first practised as an apothecary at Knutsford. After a few years he removed to Manchester, where he continued his medical practice; but he had already become deeply interested in practical chemistry, and in 1771 communicated to the Royal College of Physicians of London an improved method of making magnesia alba. Acting on the advice of his friends, he began the manufacture of this substance, whence he got the name of "Magnesia Henry," and this business was most successful. He was one of the founders of the short-lived College of Arts and Science, and lectured there not only on theoretical chemistry, but also on such technical subjects as bleaching, dyeing, and calico printing. He was an authority especially on dyeing, and also wrote on ferments, and on the value of lime and marl as manures. He was a friend of Priestley, and translated the physical and chemical essays of Lavoisier, with whom, and with other foreign investigators, he had been brought into correspondence by his experiments on fixed air (he observed that carbonic acid gas, so far from being injurious, was actually beneficial to plants). He wrote a memoir of Haller, whose career is sketched in the volume entitled "Some of the Apostles of Physiology," in which my friend Professor Stir-

ling has given an account of the lives and labors of those who have contributed to the advancement of the healing art as well as to the prevention of disease. He was one of the founders and the first secretary of the Literary and Philosophical Society. Later he became its president, and held that office at the time of his death in 1816. His son, who was physician to the infirmary, was a friend of Davy and Wolaston, and a chemist of considerable eminence. He was the author of the earliest textbook of experimental chemistry, and more than a century ago lectured on the application of chemistry to arts and manufactures. When coal gas was introduced as an illuminant he was among the first to study its constitution, to lay down rules for analysis, and to indicate the means by which it might be purified. I may here digress to observe that Mr. John Leigh, the first Medical Officer of Health for Manchester, before his appointment to that office in 1868, had given much attention to the subject of the analysis of illuminating gas, and as early as 1842 communicated to the British Association, which met that year in Manchester, an account of the mode of preparation of nitro-benzole, a discovery turned to good account by those who shortly afterwards founded the aniline dye industry.

I do not know whether these lectures given at the infirmary by the Whites and Henry were largely attended. I suspect not, for regular pupils were admitted to the practice of the infirmary for the first time in 1793. Lectures, indeed, do not seem to have been given systematically, though in 1796 Mr. Benjamin Gibson commenced a course, illustrated by demonstrations of the specimens collected by Charles White, then preserved in a museum at the corner of King street and Cross street, the site of the present Reference Library.

Gibson gave special attention to diseases of the eye, and wrote on the formation of an artificial pupil, on the extraction of soft cataracts, and on the use of the couching needle in infants of a few months old, an operation in which he appears to have been very expert. It makes us realize the benefits which anesthetics have conferred on mankind to be told that "when Mr. Gibson operated upon the eyes of young children they were really put into a sac that had an eyelet, with a cord through it, which was fastened round the child's neck, and by this means the youngsters were much more easily controlled by the assistants."

John Jordan's School of Anatomy.—Dr. Ferriar, Dr. Roget, Mr. Ainsworth, and Mr. Ransome, the father of Dr. Arthur Ransome, whose early work in Manchester in connection with the prevention of tuberculosis is happily continued with increasing effect to the present day, also took part in the courses given at the infirmary, but we must, I think, assign to Mr. Jordan the honor of being the real father of the Manchester Medical School. In 1814 Joseph Jordan commenced the systematic teaching of practical anatomy in Manchester. He was assisted by Dr. Hull, Physician to the Lying-in Hospital and a botanist of distinction, and by Mr. Brigham. It was the day of small things, and Jordan and his colleagues began their school with four students. The course was practical from the first. As this was in the days before the Anatomy Act, the acquisition of subjects for dissection must sometimes have been a difficulty. But whatever his difficulties Jordan overcame them, and in 1817 his certificates of instruction in anatomy were recognized by the Society of Apothecaries of London. Jordan was an enthusiastic anatomist, and it is related of him that a medical friend who called upon him once when he was ill espied a set of bones under the bed which Jordan said he found it convenient to keep at hand that he might distract himself by their study. Where Jordan's pupils first dissected I am not certain, but the earliest references I have traced place the school in Back Queen Street, off Deansgate, nor am I aware whether courses in other subjects of a medical education were given there.

Thomas Turner and the Royal Manchester School of Medicine and Surgery.—Manchester, however, was not to wait long for a complete medical school; its foundation was due to the energy of Mr. Thomas Turner, a remarkable man, who during his life of eighty-two years accomplished a great work for medical education. He was born at Truro in Cornwall in 1793, was apprenticed in Bristol, was a pupil of Sir Astley Cooper at the old Borough Hospitals of Guy's and St. Thomas, and came to Manchester in 1817 as house surgeon to the infirmary. He afterwards settled in private practice in Manchester, and in 1822 gave a course of lectures on human anatomy, physiology, and pathology before the Manchester Literary and Philosophical Society. Encouraged by the interest shown in these lectures he put forth, two years later, a scheme for a school of medicine and surgery. It was started in a house in Pine Street, and John Dalton, one of the most illustrious names in the intellectual history of Manchester, gave the lectures on pharmaceutical chemistry. The enterprise was immediately successful, and in the following year the staff was thoroughly organized.

Dr. Whitehead then spoke of other medical schools in Manchester and gave the history of the movement that led to the foundation of Owens College.

The foundation of John Owens, broad in its conception, though small in its beginnings, has grown with the growth of Manchester, and with the increased love of knowledge and learning, until it is now one of the greatest educational institutions in the country. It has erected a fine pile of buildings containing halls and lecture rooms, libraries and laboratories, where instruction may be obtained in every department of knowledge, and, more than that, where opportunities are afforded to those who show aptitude for original inquiry to search out fresh secrets from Nature, and to apply the new knowledge thus gained for the benefit and elevation of mankind.

For 30 years the medical students of Manchester have had the advantages of receiving in its lecture rooms, but still more in its laboratories, the training in those ancillary sciences which they must study before they can enter with profit upon their special technical education, and also in those fundamental departments of the body of medical knowledge so happily termed in the Scottish Universities the Institutes of Medicine. Within its walls, by the kindness of the College Council, rooms have been provided for all the 17 sections, while the general meetings are held in this beautiful Whitworth Hall, which commemorates the name of one of the most munificent benefactors of the College.

The medical faculty has steadily grown in number and importance since it first formed part of the Owens College. In 1872-73, when the amalgamation took place, the medical students constituted 28.45 of all those studying within the College. In 1883-84 the proportion rose (excluding the women's department) to 40.8 per cent., and in the last two years to over 42 per cent.

Some Medical Heroes.—He then gave an interesting résumé of the lives of Thomas Percival and John Ferriar, and presented an outline of the history of sanitation in the city of Manchester.

Conclusion.—From a very early date in the history of the British Medical Association the medical profession in and around Manchester has taken a deep interest in its welfare and development. At the first anniversary meeting in 1832, Dr. Charles Henry, of Manchester, a grandson of Thomas Henry, surnamed

"Magnesia," was one of the committee instructed to report on the chemistry of animal fluids as illustrative of pathology; Mr. Thomas Turner was a member of a committee on anatomy, while Dr., afterwards Sir James, Bardsley was appointed corresponding secretary for France.

The British Medical Association was founded in 1831, and in 1835 the fourth anniversary meeting was held in Manchester under the presidency of Dr. Edward Holme, F.R.S., who had long held the office of physician to the Royal Infirmary. This meeting, the first held in Manchester, was memorable in the history of the Association as that at which the system of Branch organization took origin by the amalgamation with the parent association of the Easter Provincial Medical and Surgical Association, which became the East Anglian Branch. Later in the same year other Branches were formed at Wells, Bath, and Southampton, and in the following year the Lancashire and Cheshire Branch came into existence at Newton-le-Willows. Manchester thus saw the first great extension of the local organization of the British Medical Association, and this year it sees another great step towards the perfecting of that organization. Burke called representation "the cure for all evils in the colonies." May it have a similar influence in our Association. The serious business of securing the right kind of representation will be the only difficulty you will have to contend with. I trust that the results will be to make the Association stronger, larger, and more influential than ever.

The Association held its annual meeting again in Manchester in 1854, when Mr. William Wilson, Surgeon to the Royal Infirmary, and well known for his important contributions to obstetrics and gynecology, presided. The membership had grown to over 2,000, and an important proposal, marking a further stage in the development of the Association was made. This was that the title should be changed from the Provincial Medical and Surgical Association, which it had hitherto borne, to that of the British Medical and Surgical Association. This change of name betokened an extension of the Association's work to embrace all British practitioners of medicine. Finally, after a good deal of discussion, the familiar title of the British Medical Association was chosen, and formally adopted in 1856. Under that name it has grown and flourished, and it will, I hope and believe, continue to flourish, serving as a connecting link between the members of our scattered profession—scattered in their student days in many schools, obtaining their diplomas and degrees from many universities and corporations, and ultimately practising in every district of the United Kingdom, and every region of a united empire.

It now only remains for me to thank you for the attention with which you have been good enough to listen to me. Much of what I have said was, perhaps, known to many residents in the district. My object has been to act the part of a chamberlain, who, in the old royal courts, was the introducer of ambassadors; for you, gentlemen, who have honored us by visiting Manchester, coming, as you do, from foreign countries, from the many distant parts of the British Empire, and from every district of the United Kingdom, are the ambassadors of the profession of medicine. May your labors during the next few days help to draw closer the bonds which unite the various departments of our art, which in every clime has but one aim—the prevention or the alleviation of human suffering.

In conclusion, let me quote to you the words which, though written three centuries ago, yet express so aptly the sentiments which should animate a congress such as this. The noble words of the great Lord Bacon, in his preface to the Elements of the Common Laws of England, might, I think, be taken as the motto of our Association: "I hold every man," he says, "a debtor to his profession; from the which as men, of course, do seek to receive countenance and profit, so ought they of duty to endeavor themselves, by way of amends, to be a help and ornament thereunto. This is performed, in some degree, by the honest and liberal practice of a profession; when men shall carry a respect not to descend into any course that is corrupt and unworthy thereof, and preserve themselves free from the abuses wherewith the same profession is noted to be infected; but much more is this performed, if a man be able to visit and strengthen the roots and foundation of the science itself, thereby not only gracing it in reputation and dignity, but also amplifying it in profession and substance."

Tropical Diseases.—Sir William R. Kynsey, president of the Section on Tropical Diseases, said after a brief introduction: In the words of Lord Salisbury on a memorable occasion, "We live in a small bright oasis of knowledge surrounded on all sides by a vast unexplored region of impenetrable mystery. From age to age the strenuous labor of successive generations wins a small strip from the desert and pushes forward the boundaries of knowledge;" or, as that great philosopher, Professor Huxley, well puts the same idea, "The known is finite, the unknown infinite: intellectually we stand on an islet in the midst of an illimitable ocean of inexplicability; our business in every generation is to reclaim a little more land, to add something to the extent and solidity of our possessions."

Marvellously minute observation is perhaps the most notable feature of scientific research in the last quarter of the nineteenth and the opening years of the twentieth centuries, combined with a severe spirit of criticism, and that now, as has always been the case, science, like religion, metes out its rewards only to those who diligently seek it. In medicine one of the most surprising discoveries has been the relationship which has been proved to exist between insects and grave disease—the direct outcome of the modern spirit of research.

I have no intention of occupying your time with an account of the successive malarial discoveries made by observers of different nations which can now be found in the text, and are known to the man in the street, nor with the unworthy questions too often raised by discussions about priority. But it cannot be too often repeated that in the whole story of medical science there has been recorded nothing more wonderful than the prophylactic measures which have followed on the discovery of the malarial organism by the illustrious Frenchman, Laveran, and by the investigations into its life-history by Italian, German, and American observers, and by our own countrymen, Manson and Ross, according to the experimental method advocated by Bacon and Harvey. If these investigators have no other reward, they will have the highest satisfaction men of science can enjoy—that of extending our knowledge of disease and of doing good to humanity. I consider the discovery of the malaria parasite—and that man is its temporary and the mosquito its definitive host and transmitter, that it completes its asexual life and prepares its sexual forms in human blood, while it completes the sexual cycle of life, that by which the life of the parasite external to man is assured in a particular species of mosquito, and that man becomes infected only through the bite of the Anopheles—one of the most epoch-making events of the age in which we live. It may be truly said that scientific research has gone hand in hand with practical and preventive medicine.

The physician can give quinine with a full knowledge of how his remedy acts; and the sanitarian can try, and in many cases succeed in preventing the occurrence of malarial diseases by methods devised on scientific principles. The treatment and the modern prophylaxis of malaria exemplifying the Greek idea of Socrates and Plato that "right knowledge involves right action."

Another most gratifying result of the study of the causation of malaria, and directly traceable to it, is the increased interest taken in the investigation of all tropical diseases by the establishment of schools of instruction and the formation of scientific expeditions. In the schools of tropical medicine of London and Liverpool, and from the lectures on diseases of the tropics in many of our colleges, the medical man intending to practise abroad can acquire an acquaintance with the diseases he will be called upon to treat, special advantages long enjoyed by the army, Indian, and naval services in the great schools of Netley and Haslar. I have the most grateful recollection of the instruction I received at Netley, where diseases from all parts of the world could be seen and studied. No one who had the privilege of their acquaintance can forget the gifted and amiable Parkes, the father of hygiene, that accomplished gentleman speaker and writer Maclean, whose lectures may still be read with profit, and Aitken, the first pathologist of his day, whose work is a storehouse of facts relating to tropical medicine. It is pleasant for an old Netley man to feel that the instruction in that great school has not deteriorated, and that it continues to send forth highly-trained officers ever ready to fight disease in any part of the world. If the rumor is true that the army school is to be soon moved to London, I am sure you will all join me in wishing it a brilliant future.

In the history of the past year there is no great discovery to be recorded; it may be looked back upon as one of steady progress in elucidating some of the many problems of tropical medicine, the greatest and most beneficent being in the scientific prevention of disease. In the case of yellow fever the mosquito—a Culex, not Anopheles—has been tried and found guilty of being the sole agent in the spread of that disease. In Havana yellow fever was endemic for a century and a half; during the past year it has been freed from the scourge by killing the mosquitos in the neighborhood of each focus of disease as discovered, and by carefully disinfecting every house that had lodged a yellow-fever patient in order to destroy the mosquitos that had bitten a sick person. This great sanitary triumph must ever redound to the honor of American medicine.

No excuse is necessary in this section for dwelling a little on the important subject of the prophylaxis of malaria. An epidemic of any kind is among the most costly in life and money that can befall a town or district. An epidemic of malaria differs from other outbreaks of disease in this important fact, that its effects are not limited to the deaths it causes, but that it often leads to years of suffering, poverty, and depopulation.

I have high authority for stating that, taking one year with another, malaria destroys twice as many people in India as cholera, smallpox, and all other epidemic diseases put together. It is a matter of history that the same cause almost annihilated the soldiers of the Walcheren expedition, and the army under Wellington in Spain was so assailed by malaria that according to Ferguson the enemy and all Europe believed the British forces were exterminated. Malaria stopped the great Panama scheme of de Lesseps. I have known districts in Ceylon almost depopulated. A most disastrous outbreak occurred some years ago at Galle—a town previously malaria free—attended with great loss of life in consequence of the construction of a railway, the embankments of which were made by excavating pits at the sides that soon were filled with rain water. In those days the origin of the fever was, of course, attributed to disturbance of soil. We now know the pits provided breeding places for the Anopheles, and the Sinhalese and Tamil laborers from malaria districts supplied the organisms.

Although we were ignorant of the true conditions which caused the outbreak, we advised the filling up of the pits on the disturbance of soil theory with satisfactory results, proving that much can be done in the prevention of disease before full knowledge of causation is reached.

I will only occupy a few minutes of your time while I describe two experiments—one made by the Colonial Office on Dr. Manson's advice, and the other by the Japanese Government, which clearly show it is both possible and practicable to prevent malarial infection.

In the experiment conducted by Drs. Sambon and Low in the Roman Campagna and in London in order to prove the truth or error of the mosquito malarial theory, and also how far protection against malaria might be consistent with the ordinary avocation of life, two experiments were necessary, one that healthy persons in London should be bitten by infected mosquitos from a malarious region, and the second that men should live in an undoubtedly malarious place during the fever season, being protected only from the bites of mosquitos. Those bitten in London contracted ague. Drs. Sambon and Low and two others lived in a mosquito-proof hut in a most intensely malarious place in Italy, where all the inhabitants suffered from malaria. The four inhabitants of the hut remained perfectly healthy all the time, and, I believe, are so still.

The experiments by the Japanese Government were carried out on the Island of Formosa, and they furnish a most conclusive demonstration of the relations between mosquitos and malaria. A battalion of soldiers who were completely protected from mosquitos for 161 days during the malaria season escaped the disease entirely; whereas there were 259 cases of malaria in another battalion in the same place and during the same length of time not protected from mosquitos.

I am sure you will agree with the conclusions of Drs. Sambon and Low that their experiments prove that mosquitos only are capable of transmitting malarial fever; that protection from their bite implies absolute immunity; and that protection can be easily obtained. If further proof is considered necessary for large bodies of men, it is furnished by the Japanese experiment.

By a study of the life-history and surroundings of the Anopheles, and by varied and long-continued experiment, Ross has determined the best means of preventing malarial infection. He advised the extermination of the Anopheles, and although this is difficult it is not so difficult as at first sight it appears. These mosquitos breed in small pools of a certain kind easily recognized and easily dealt with, always close to human habitations, as the females must pass frequently between the pools where they lay their eggs and the houses where they obtain their food. If the Anopheles are found in a house the breeding puddles are close by. The great practical points derived from Ross's work are two:

1. That the life of the Anopheles is in direct and intimate relation with the annual epidemics of malarial fever.

2. That it is only necessary to drain the Anopheles puddles and not the whole of the malarious district.

In conclusion, I believe the discovery of the malarial parasite, and the investigations into the life-history of the mosquito which conveys it to man have placed us

in the position to suggest measures which if carried out would have the effect in an unhealthy district of largely reducing the amount of malarial fever and eventually of exterminating it.

1. Malarial fevers should be included and notified among infectious diseases, so that precautions could be taken to prevent their spread.

2. Persons suffering from malaria primary infections or recurrents should be isolated and treated with quinine to prevent as far as possible the infection of mosquitos.

3. Persons infected with malaria should be prevented coming to a healthy place to infect mosquitos.

4. The puddles in which the Anopheles breed should be drained and filled up to destroy the larvæ.

5. Doors and windows of houses, gaols, and hospitals in malarious districts should be screened with wire gauze, and beds should be provided with netting to prevent mosquitos entering and biting the occupants.

(To be Continued.)

SOCIETY OF DERMATOLOGY AND GENITO-URINARY SURGERY.

Stated Meeting, Held May 9, 1902.

The President, R. H. Greene, M.D., in the Chair.

Dr. James Pedersen presented an Armenian, twenty-eight years old, who had been admitted to the genito-urinary service of Bellevue Hospital in February. The patient's imperfect knowledge of English made a detailed history impossible, but it appeared that for many years he had had a mass involving the right side of the scrotum, and that four days before admission it had begun to increase in size without discoverable cause. Examination revealed a pear-shaped, semi-elastic or boggy tumor involving the right testicle and extending upward into the inguinal ring. In the region of the testicle it was moderately painful and tender. At one point it was translucent and by the aspirating needle a little clear serum was evacuated. Hernia was considered and excluded. Antispecific treatment was tested for a week without result. An exploratory operation was therefore thought justifiable, and it was undertaken with the expectation of removing the testicle with the tumor if it proved at all suspicious of malignancy, as its size interfered with the man's ability to do his work. It was supposed that an unnoticed traumatism had started up an inflammation in the tumor. An incision was made over the region of the testicle. The tunica vaginalis was found greatly thickened; it contained a little serum. The testicle was tumefied and dusky in appearance. It was decided to remove it as suspicious, the patient being desirous of radical relief. The incision was carried up, laying open the inguinal canal in order to reach the limit of the tumor; the pedicle was transfixed and ligated. On starting to cut it through, a mass of omental fat protruded. The ligatures were cut away, and by extending the operation an incarcerated omental hernia was exposed, closely attached to the upper pole of the testicle. The hernial sac was dissected out, and the redundant omentum ligated and cut off. The appendix now presented in the neck of the sac, but as it was healthy its removal was not attempted. The sac was ligated in the usual way and the operation completed by the Bassini method. The testicle was not removed. Primary union was obtained. The patient left the hospital four weeks after the operation. Some tumefaction of the testicle remains and there is some thickening of the cord near the external ring, apparently only of a chronic inflammatory nature.

Dr. Howard Lilienthal believed that Dr. Pedersen's case was one of congenital hernia and that the only question of diagnosis now related to the thickened mass. He asked if the doctor had cut off the sac entirely.

Dr. Pedersen replied that he had, and that the lower portion of the sac was adherent to the testicle. Ligatures were passed around it and it was drawn up, but not in the same way that one draws up a purse-string suture. It was transfixed and tied at a level with the internal ring.

Dr. Lilienthal said that the mass then could not certainly be the sac and that it probably was an inflammatory thickening or the result of some disturbance of circulation.

Dr. Frederic R. Sturgis (guest of the Society) said that the hernia was probably congenital. The thickening might be due to some inflammatory trouble after the operation, although he confessed that he thought of syphilis as a cause of the thickening. One hundred and eighty grains of the iodides for a week he did not think was sufficient to exclude the possibility of syphilis; the dosage was too small. The case reminded him of one seen some years ago in which he opened the scrotum and satisfied himself that he had to deal with a syphilitic process. The wound was closed and, much to his surprise, the swelling went down without further treatment, just as this swelling did. The thickening he thought might be due to one of two things: (1) Syphilitic infiltration of the cord or (2) inflammatory infiltration after operation. He strongly favored the diagnosis of syphilis.

Dr. R. H. Greene thought the swelling above the testicle was very interesting; if it had diminished since the operation he would be inclined to believe that it was an inflammatory exudate; but if it had increased in size he thought he was justified in thinking that the patient might be having a relapse of the hernia.

A Case of Atrophy of the Testicles.—Dr. F. Cabot presented a patient who came to the Presbyterian Hospital complaining of wasting of the testicles. He gave a history of having had mumps fifteen years previous on both sides, and for fourteen years past he has had a varicocele. The case was of particular interest, both on account of the varicocele and mumps as a cause of atrophy of both testicles. The varicocele was a very large one and the patient wished to know what could be done for him. Whenever he reclined the varicocele almost entirely disappeared. The doctor thought this was a favorable case for the subcutaneous method of operation.

Dr. Goldenberg failed to see what benefit could follow such a procedure upon the varicocele when there was atrophy of the testicle. Some time ago a man presented himself who, in his early youth, had had mumps with atrophy of the testicle of one side. This man was then about sixty-six years old, with a hypertrophied prostate and, much to the doctor's surprise, the lobe on the side of the atropic testicle was larger than that on the other side.

Dr. Pederson thought that it would be worth while to give the patient the benefit of a doubt and operate. He thought the right testicle was only of moderate size and the positive testicular sensation on pressure was present; the left testicle was small, but here also the testicular sensation existed. Both testes were rather soft.

Dr. Eugene Fuller (guest of the Society) said he would do the subcutaneous ligation in this case, although he would offer but little encouragement for the betterment of the testicles. In reference to Dr. Goldenberg's question he said that he remembered a case, seen several years ago, in which a man with mumps ran a temperature of 105° F., was delirious, and one of his testicles was greatly enlarged. On the corresponding side the

prostate and vesicles were extremely tumefied at the time. His delirium seemed to be due either to some inflammation of his sexual apparatus or to his high temperature. The testicles did not atrophy afterward. It showed that the testicles and seminal vesicles had both been involved in this case. He had never seen any hypertrophy following these cases.

Dr. Goldenberg said that he intended to say that in spite of the atrophy of the testicle the patient had a hypertrophied prostatic lobe on the same side, showing that the atrophy had no effect upon the prostate.

Dr. Fuller said he had known of cases of atrophy of the testicle without atrophy of the prostate on that side, a history of mumps being absent.

Dr. Lilienthal believed that in the presence of this varicocele an operation was proper and his preference would be for the open operation. He mentioned the case of a man who had an enlarged prostate and, in the days of castration for this trouble, he was castrated. This patient was fearfully annoyed until death, which occurred one year after, with a tremendous ptyalism, his parotid glands acting in an astonishing manner. He was kept on atropine nearly all the time in attempts to stop the flow of saliva.

Dr. Sturgis said that the question of operation of course related only to the varicocele and he did not see what was to be gained by the subcutaneous method, because the collateral circulation would reestablish the condition. He would prefer either the open operation or else the ablation of the testes after the method of Henry, which lifts the testicle and gives the veins a chance to empty. The testicle on the right side was practically gone.

Dr. Fuller said that, in employing the subcutaneous method, he did it always in a radical way and he was always sure of his results because he did it correctly; it was a more technical operation. He believed that when he once destroyed the veins he never needed to attempt an ablation of the scrotum. After the removal of the big veins the dartos regains its tone and the redundency of the scrotum disappears in six months. He did not see the necessity for ablation of the scrotum except in cases of elephantiasis of that part.

Dr. Greene said that one or two years ago he operated by the open method in a case similar to this and he could not say whether there was any marked increase in the size of the testicle. The moral effect on the patient was a good one, for he soon got married. With regard to the question as to whether either side of the prostate atrophied and corresponded to the atrophy of the testicle of the same side, he thought it would be a difficult thing to decide, because it was particularly hard to determine by feeling through the rectum whether the prostate was enlarged or atrophied. It is said that the hypertrophic prostates are mostly inflammatory and that the same things may cause an hypertrophy of one part and an atrophy of another part.

A Case for Diagnosis.—Dr. T. G. Lusk presented a man who had had a macular eruption of red color on the right side of the face since one year ago last February; it started gradually and extended until it involved the entire right cheek. There was considerable itching. No scales are present. The affection is limited to the right side of the nose and cheek. It started from the nose. At the present it does not itch, but annoys the patient on account of its conspicuousness.

Dr. Leviseur thought the condition was an erythema; by pressure the redness could be made to disappear. It might be the beginning of a lupus erythematosus. He thought the localization of the redness might have something to do with the patient's occupation, as he is a fireman, and perhaps exposes one side of his body toward the heated furnace.

Dr. Whitehouse said that it was exceedingly difficult by artificial light to determine anything definite with regard to the diagnosis. He thought it might be one of two things. He first thought of a lupus erythematosus, atypical in form, being asymmetrical, and lasting so long without atrophy or other signs of the disease. The man had had the same occupation for eleven years, and the eruption had existed only one year, and was unilateral, which would hardly be expected if occupation were the cause. Very frequently he sees patients with a form of erythema depending upon a low grade of sepsis with some disease of the nose, such as a deflected septum, or small ulcerations.

Dr. Goldenberg thought that it was an erythema unilateralis—rather an unusual form of erythema due to disturbances within the nose. He failed to find symptoms of lupus erythematosus even if one remembered the description of Hebra, who first called lupus erythematosus seborrhœa congestiva. The affection might develop into a lupus erythematosus, but such a diagnosis was not possible at this time.

Dr. Lusk said that it did not appear to be a case of lupus erythematosus, because the color was a bright red instead of purplish; there was an entire absence of scales and the demarcation was not pronounced.

Specimens of Calculi.—Dr. Eugene Fuller presented several such specimens. The first were taken from an old man who came for treatment with prostatic symptoms and vesical hemorrhages. He was a very large, stout man and a perineal operation had been done three or four years ago for stone when he had all the symptoms of stone, but none was found. In operating Dr. Fuller found a prostatic pouch which contained a collection of stones, all facetted, seventeen in number, composed of uric acid. The second collection of calculi shown were taken from a patient in the City Hospital who gave prostatic symptoms. He suffered from frequent and painful urination. He had a boggy prostate. During operation there was found at the entrance to the membranous urethra a fistulous opening which communicated with a cavity; the finger following the probe entered a soft, velvety-lined cavity as large as one half an English walnut, in which were found the calculi presented. The cavity was curetted, packed with gauze, and a perineal drain placed in position. The third specimen presented was taken from a man who came into the hospital suffering from prostatic retention and was straining tremendously. There was a doubt whether a stone was present or not. On entering the bladder suprapubically a pouch with a stone was found; the calculus was smooth on top and rough below; it was lying flush with the prostate and was wedged in the cavity so tight that it would have been impossible to get it out without the operation. The fourth stone presented was removed from a patient six weeks ago. He came with a history of retention and said that twenty years ago he had had gonorrhea with a penile fistula resulting. When the patient was first seen his penis was almost in a state of constant erection, but the end hung down. He had to sit down to urinate and no urine came from the meatus but leaked through the fistula. When the probe was introduced into the latter it struck a stone; this stone had formed in the fistulous tract and had gradually increased in size and become wedged. The patient was operated upon, the scrotum being passed over the stone, and then cut through.

Dr. Cabot said that in cases of enlarged prostate with symptoms of stone it was a very good plan to remove the prostate as well as the stone as pointed out by Dr. Fuller. Often one sees cases with symptoms of stone in which the prostatic condition is overlooked. Many of these cases of prostatic trouble are the cause of the stone formation.

Dr. Goldenberg said that two weeks ago he saw in consultation a patient with stone in the prostatic urethra. It was removed. Ten days afterward the patient was taken ill with renal colic.

Dr. Greene had seen prostatic stones in two cases, in both of which they were of the phosphatic variety and looked like tiny oyster shells.

Dr. Lilienthal asked Dr. Fuller if he could give any reason for the facetting of these stones. In some cases there were numerous stones without facets. He took on one occasion eighty stones from one bladder, the sizes varying from that of a pea up, and all were perfectly round. If the stone becomes facetted it meant to him that the stone must remain in one position for a long time.

Dr. Fuller thought that if the stones were free, rolling around with others, they were more likely to become polished and remain round; when these stones were facetted they were generally in a pouch. A point that interested him was the etiology of the cavity in which the stones were found; he could not find a cause for it, although he thought it might be due to a localized necrosis, perhaps tuberculous in character. In the City Hospital a few years ago, at a postmortem, he found a spot of tuberculous necrosis as big as a marrowfat pea; it had probably become cheesy, the urine had entered and produced a cavity with granulation tissue forming around the edge of the necrotic area. He remembered another case occurring in a tuberculous patient in which there was a cavity with a beginning calculi; this patient gradually recovered, but later developed a tuberculosis in one of his epididymes.

Dr. Greene said that these stones might be formed at the mouths of prostatic ducts which became obstructed, the secretion continuing and solidifying, the same process as that producing the so-called corpora amylacea.

A New Method of Prostatic Exploration.—Dr. Lilienthal said that he had a man under observation at the present time who had a right-sided hernia and who had been troubled for a long time with an enlarged prostate. He had a cystitis with a considerable amount of pus in his urine. Examination per rectum revealed a prostate very moderately, if at all, enlarged, but by examining the hernia he found that he could introduce his finger into the bladder and map out the prostate very easily. The lobes could be distinctly felt, the invaginated tissues interfering to the touch not more than a fairly thick glove over the finger. In the future if he was called upon to examine a patient's prostate, and if that patient had a hernia (a common combination), he would make use of this simple method of exploration.

NORTH BRANCH PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, Held May 15, 1902.

The President, A. M. Eaton, M.D., in the Chair.

Dr. J. Cardeen Cooper read a paper entitled Acute and Chronic Tuberculous Phthisis, with Cases, in which he gave a résumé of the history of the doctrine of the communicability of phthisis and stated that it is now generally recognized that the disease is both hereditary and inoculable. The subject was considered under the two subdivisions, Acute Phthisis and Chronic Phthisis. The greater number of cases of the acute variety occur between the ages of twenty and thirty and are frequently mistaken for acute lobar pneumonia, and in children the diagnosis is often confused with broncopneumonia. In children the disease frequently follows whooping-cough and measles, while in adults the causes more closely resemble the hereditary tendencies, together with a "run down" system. The prominent symptoms are a chill or series of chills, followed by high fever, rapid pulse, restlessness and short breathing; usually some considerable portion of the lung tissue is airless, and there is always impaired resonance of the apices, and the breath sounds are harsh. Expectoration is copious and contains tubercle bacilli; hemorrhage may occur at any time; the patient rapidly loses strength and weight, and in the more quickly terminating cases death usually results in from six to ten weeks; on the other hand it may not result fatally for months, becoming rather a chronic case. Three cases were reported, varying in age from twenty months to twenty-six years, the child aged twenty months dying in about four and one-half weeks; the woman aged twenty-one years in about ten weeks, while the third case, a woman, aged twenty-six, after a residence of fourteen months in another climate, returned home apparently in good health. Pulmonary phthisis of the chronic type was thought to occur in a large measure among people whose occupation necessitated their constant habitation of poorly ventilated rooms, where in the course of their employment they were continually inhaling air laden with fine dust, such as is found in the works of sculptors, mines, etc. Poor food, bad air, overwork and improper hygiene no doubt also act as predisposing causes of this condition. The first symptom noticed is usually a slight dry cough, and in the early stages the sputum examination may or may not be negative so far as the presence of yellow elastic tissue and tubercle bacilli are concerned. There is usually a rise in temperature; sweating and hemoptysis may occur at any stage of the disease. Expansion is impaired; resonance is defective and the percussion note high pitched in the apices. Three cases were reported, two of which died in fourteen months and two years respectively after coming under the author's observation, the other apparently recovering.

The discussion was opened by Dr. Howard S. Anders, who stated that while he did not believe that drugs should be considered as the first and foremost agents in the treatment of tuberculosis, he felt that there were many cases in which this line of treatment was of distinct advantage, either as a palliative measure, or to increase the power of resistance of the individual in combating the disease. As a remedy of the latter class, the oils were thought to hold the first position, and in the opinion of the speaker olive oil is superior to either cod-liver oil or the animal fats, such as butter and cream, being more easily digested and giving quite as good results. Reference was made to the experiments of Dr. Harper of England with the urea treatment, which is administered in doses of from 15 to 20 grains three or four times a day, and it was stated that in the incipient stages of the disease, when the condition was uncomplicated by mixed infection, the results had been exceedingly favorable, but when mixed infection had taken place, the outcome was no more favorable than with the ordinary treatment. Ichthyol and other similar remedies were referred to, none of which, in the speaker's opinion, was of any especial value. Attention was directed to the favorable results obtained by Dr. Mays with injections of 2½ to 5-per-cent. solutions of nitrate of silver, although the speaker had had no personal experience with this remedy. As a general tonic, the intermittent use of strychnine for four or five days at a time; and as cardiac tonic, if too much fever is not present, digitalis was recommended. Alcohol, it was thought, should be used with as much circumspection as any other drug. For the relief of cough codeine was thought to give probably the best results, although heroin in doses of $^1/_{30}$ to $^1/_{60}$ of a grain every two or three hours was favorably considered, as was also calcium chloride. For the relief of hemoptysis, the in-

ternal use of gelatin was recommended as favoring the increased coagulability of the blood.

Dr. Lawrence F. Flick stated that he believed climate in its literal sense was of very little value in the treatment of tuberculosis, this conclusion having been reached by personal experience, dietetic and hygienic measures and environment being in his opinion the keynotes to the treatment of this condition. Out-door life and forced feeding, such foods as beefsteak, milk and eggs being employed, were thought to be the principal factors in the treatment and, with the observance of these directions, the opinion was expressed that 100 per cent. of the cases could be cured, provided the disease was diagnosed before it reached the softening process; and even if the latter stage has been reached, it was thought 75 per cent. of the cases would recover. In cases in which there is an increase in the temperature and pulse-rate, absolute rest, and in which the temperature is about normal, partial rest and regulated exercises were recommended. The opinion was expressed that perhaps the doctrine of the incurability of tuberculosis had been too widely diffused, and that the same degree of care had not been exercised in its treatment as in other conditions, which would perhaps to some extent account for the great mortality. The speaker believes that in all cases of tuberculosis, there has been a time when there was but a small dose of the disease in the system, and that the so-called acute cases, or galloping consumption have no doubt been an infection of long standing, but unrecognized. The belief was also expressed that perhaps 50 per cent. of the cases in which the germs have been implanted recover without treatment. Attention was directed to the importance of thorough examination, together with night and morning temperature observations in all suspicious cases.

Dr. Louis Jurist stated that he quite agreed with the previous speaker in that many cases of tuberculosis were unrecognized during the early stages. Ichthyol was thought to have no value whatever, and the speaker's experience with heroin had been that it had produced practically all of the symptoms of the morphine habit. Discipline, or the precise following out of directions as given by the physician, was thought to be the most important factor in the treatment of tuberculosis, and if this can be obtained the belief was expressed that just as good results could be obtained in Philadelphia as in any other climate.

Dr. S. Solis Cohen stated that he believed the most important factors in the treatment of tuberculosis were air, water, food, sunlight, rest and exercise, although drugs were considered of great value as an adjunct to these measures. While the value of climatic treatment was not discounted, the speaker felt that, as such a large percentage of all the cases of this disease were unable to avail themselves of its benefits, we should endeavor to simulate as nearly as possible these conditions at home, by keeping the patient in the open air as much as possible and by thoroughly ventilating the living and sleeping apartments. The insistence upon the strict observance of the directions laid down by the physician was thought to be necessary and the difficulty of securing proper discipline was commented upon. The opinion was expressed that 75 per cent. of all cases of pulmonary tuberculosis would recover if properly treated, but the ideal treatment, it was thought, could be obtained only in the homes of the wealthy or in the cases of the very poor, who had the advantage of the sanitaria. Air and light should always be insisted upon, as they are important factors in increasing the resisting power of the patient. The use of the cold plunge bath in the morning was recommended; while in some cases this may be taken immediately upon rising in the morning, in the majority of cases it was thought better to warm the surface of the body first by an application of hot water in order to avoid a material reduction in the temperature. For the reduction of abnormal temperature, the application of the cold water coil or ice-bag over the precardial area was recommended. The internal use of water as a means of increasing the eliminative functions of the body was favorably commented upon. Regarding food, reference was made to the meat diet recommended by Salisbury, which consisted in lean meat chopped fine, with the fibrous portion removed, the patient being recommended to eat this raw; if this could not be done, then in the form of lightly browned Hamburger steak. The value of this treatment has been emphasized by the more recent reports of the muscle plasma treatment and of the urea treatment of Harper of England. The food should be as much as possible of a nitrogenous character, while the consumption of starches should be reduced to the lowest margin. The administration of large quantities of fat is one of the most important factors in the treatment of tuberculosis, and cod-liver oil, as well as milk and cream, were thought to be the preferable means of taking it. The judicious use of rest and exercise according to the condition of the patient was commented upon, and horseback riding and walking were recommended, as were also breathing exercises.

Dr. H. Booker Mills said he thought that many of the patients who had gone to other climates and returned apparently no better had received great benefit from their sojourn, and that their after improvement depended to a great degree upon the effect of these climatic measures. In support of the value of climatic treatment he cited several cases, among them that of a child who manifested no symptoms of the disease while residing in Denver, but a few months after coming to Philadelphia developed symptoms of phthisis, the symptoms being ameliorated upon going to Atlantic City or the White Mountains, but immediately becoming prominent upon her return to Philadelphia. As to the use of heroin he stated that in his experience much better results had been obtained with the liquid form.

Dr. J. Cardeen Cooper, in closing the discussion, stated that he felt a great deal depended upon the climatic conditions, and that in the term "climate" could be included not only the change from one latitude or altitude to another, but the change from the city to the country. He stated that he did not believe the urea treatment was of much value; in his opinion cod-liver oil is the most favorable way of administering fat. As a diagnostic factor attention was directed to the importance of carefully noting the nature of the chest expansion, the percussion note and the pitch of the resonance note.

BOOKS RECEIVED.

MOTHER AND CHILD. By Dr. E. P. Davis. 12mo, 264 pages. J. B. Lippincott Company, Philadelphia.

DISEASES OF THE NOSE, PHARYNX, AND EAR. By Dr. Henry Gradle. 8vo, 547 pages. Illustrated. W. B. Saunders & Company, Philadelphia and London.

CELLULAR TOXINS OR THE CHEMICAL FACTORS IN THE CAUSATION OF DISEASE. By Drs. V. C. Vaughan and F. G. Novy. 8vo, 496 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by Dr. Solomon Solis-Cohen. Vol. IX. By Drs. W. Winternitz, A. Strasser, B. Buxbaum and E. H. Kisch. 8vo, 570 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.